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December is a time of mounting excitement; carols in the music period, Santas, stars and wise men in drawing, cutouts on school windows and in the classroom. Our cover shows a young man putting up Christmas decorations. At this time of year he probably has one thought for his school work and two for Christmas, but in the task shown he is combining the two. The picture was made by Mr. Richard Randlett of Westwood, Mass. Possibly you have seen some of his pictures in gift shops or art stores as well as on our October cover.

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THE SOCIAL ASPECTS OF THE SOCIAL STUDIES

Edgar B. Wesley

Visiting Professor of Education, Stanford University,
Stanford, California

"I steer clear of clubs and organizations," said a wizened little man. "Taxes are all wasted," declared the chronic grouch. "We'll exhaust this vein of coal and let future generations take care of themselves," said the mine owner. "Throw those out-grown clothes into the incinerator," said the housewife.

These four speakers demonstrate questionable attitudes toward people, a social institution, a natural resource, and economic goods.

"I shall be glad to meet your visitor, for I'm sure he must be an interesting person," said the invited guest. "In spite of their defects, I think the public hospitals are rendering a great service," declared the appreciative patient. "We'll turn these weeds and leaves under and thus enrich the soil," said the farmer. "With this improvement we can produce more shoes with no increase in cost," the manager explained.

These four speakers demonstrate commendable attitudes toward people, an institution, the earth, and an economic product.

The foregoing comments, questionable and commendable, illustrate the whole range of the social studies, for the field is concerned with human relationships between and among:

A. People and People
B. People and Social institutions
C. People and Earth
D. People and Goods

Let us examine the nature and scope of each of these areas.

A. *People-People.* The relationships among people are varied and complex. For the sake of simplicity let us note three kinds of social contacts: 1. those between individuals, 2. those between an individual and a group, and 3. those that prevail between and among groups.

1. A socialized person is aware of other individuals. Under normal circumstances a person is ready to notice others and exchange a smile, a nod, or a word. One is always conscious of the degree of the other person's readiness for communication. If the person is reading, talking, or working, or is lost in abstraction and preoccupation, one passes him without any attempt to establish a relationship. Ordinarily, however, the normal person has his social antennas tuned to receive messages.

When two persons meet and begin to talk they are sharing some mutual interest. The relationship may be casual or intimate, short or prolonged, accidental or planned, friendly or hostile. The observer who is aware of the meeting of the two persons wonders about the occasion, the subject of conversation, and the potential result. Thus the observer is almost unwittingly centering his thoughts, not upon the individuals, but upon the *relationship* between them.

Our days are filled with a succession of these person to person relationships. The customer and the merchant, the teacher and the pupil, the motorist and the mechanic, the parent and the child are examples of these daily relationships.

2. The individual is constantly establishing relationships with crowds, groups, congregations, and assemblies. He may merge with them and become a temporary member or he may refrain from joining. Whatever be his course of action, he is aware of the complicated network of informal relationships that make him a member of a group of passengers, a spectator at a game, a hearer at a lecture, or any one of dozens of such situations. This person-group relationship is influential and often determinative in establishing attitudes, beliefs, and habits.

3. The third type of person-person relationship is that which exists between and among groups. One team opposes another, one class entertains another, and one gang wars with another. These intergroup relationships are also influential. If the individual accepts the group ideas he may find his reactions, his course of behavior, and his loyalties are all determined for him. He may almost lose his individuality and become merely an element in a group.

B. *People-Institutions.* The second major kind of human relationships is that which exists between people and social institutions. While the distinction between groups and institutions is not sharp, it is discernible. The group remains a collection of individuals; its composition is constantly changing and its existence tends to be fleeting. A person tends to regard groups in terms of the individuals whom he knows or recognizes. On the other hand an institution, although composed of people, tends to become formal, abstract, impersonal, generalized, and permanent. Institutions are organized cooperation. One's attitude toward "the church" is quite different from his

attitude toward a member; one may disapprove of a union but like a particular member of it.

The social studies seeks to understand institutions, their nature, services, and effects, and to examine the relationships that they establish with individuals. Institutions also develop complicated relationships with one another. The points of contact between business and labor, the church and the state, the family and society are numerous and complex. In fact, they constitute the most difficult area of the social studies.

C. *People-Earth.* The relationships between man and his physical environment are interesting to pupils of all grade levels and are among the easiest to understand. Geography has no difficult ideas or concepts and provides a wealth of information concerning regions, climate, soils, products, and industries.

Man has wedged a never-ending struggle with nature. He seeks the most pleasant and profitable areas, he hunts for its varied resources, and he continually modifies his clothing and houses to fit nature's demands. Interesting, comprehensible, and exciting, these relationships are easily grasped in the lower grades, but they continue to be a growing source of useful information as man advances in his conquest of the earth.

D. *People-Goods.* Out of earth's resources man has fashioned thousands of products. Since they are limited in number, they acquire economic value. Around these processes of satisfying material needs cluster thousands of relationships. Labor unions, money, department stores, banks, farms, factories, railroads, and corporations are only a few examples of the infinite number and variety of economic institutions. No one can escape becoming involved in economic relationships, for they provide the bases of material existence. Like all social relationships they tend to become more complicated as society advances.

From this description and analysis of the social studies field one can derive several interpretations and conclusions. Different persons will naturally react in varying ways. The author's principal reactions are as follows:

1. Since success in life is so highly correlated with the understanding of human relationships, the social studies should provide more material that bears directly on these relationships. Delete much of the history, the study of government structure, place-product geography, theoretical economics, and the study of primitive peoples and concentrate directly on the problems of present day living.

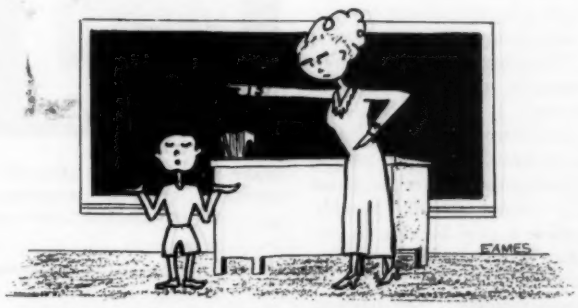
2. Teach the democratic process by establishing it at all grade levels. The skillful, democratic teacher who trusts children will find the methods that enable pupils to grow in responsibility by assuming responsibilities; grow in toleration by practicing it; grow in acquisition of skills (not by drill and premature learning) but by employing them in solving pupil problems.

3. The social studies curriculum should place greater stress upon social activities and less upon knowing. Ability and inclination to do are more important and functional than knowing. Desirable social relationships are promoted by active participation rather than by intellectual perception. Wise action is more desirable than abstract knowledge.

4. The formal study of history makes almost no contribution to the understanding of human relationships. The only history which functions is that which the student learns in his study of a topic or problem which he himself has chosen. Consequently the social studies should give less attention to the direct study of formalized history and more attention to contemporary situations, institutions, and culture.

Every adult realizes the importance of understanding people, of knowing how to oppose and cooperate. As civilization advances our control of things becomes simpler and more complete; conversely, our human relationships become more involved and complex. The human organism, physically and psychologically, has not been able to modify itself fast enough to be competent or at ease amid the whirl of modern industrial progress. The imperative need of the times is, not mechanical invention, but social improvement. Consequently the social studies — the one area in education that is devoted exclusively to the study of human relationships — deserves greater attention than ever before.

Educators are convinced beyond all doubt that this is the critical area. They see its need and visualize its potentialities. They believe that more attention to pupil needs, current issues, social attitudes, character development, and broad social understanding would lead to better citizenship and widened circles of interest, toleration, and good will. If their proposals were accepted we would see a rapid lessening of suspicion, hostilities, and hatreds, both within and beyond our national boundaries.



Pupil: You can't do that to me. I'm a special problem.

PEP UP YOUR ART PROGRAM

Reino Randall

Associate Professor, Fine Arts, Central Washington College of Education, Ellensburg, Washington.

If art is to have its rightful place in the school curriculum there are many problems which must be solved in the art program as it functions today in our schools. We, as teachers, administrators, and "college curriculum builders" should initiate a constructive art program rather than give only lip service to these problems.

The average teacher in the classroom today has a greater fear of teaching art than he has for any other subject. What is the reason for this fear? A lack of confidence due to lack of training. Most teachers going into our schools leave college with as little as one art unit and possibly as much as five or six units of training. This does not take into account the thousands of teachers who have gone back into the profession after being away from teaching for twenty or thirty years. How can these teachers step into a classroom and handle thirty or forty pupils in a well-rounded art program where a knowledge and understanding of the creative process is necessary? More training is the crying need in most cases. But while that is being accomplished in summer school and by correspondence courses there are many ways to improve the teaching of art and to develop an effective art program. The following suggestions are a few of the things that a teacher can do for himself.

Art and Teachers

In every state there are art organizations that are always open to all teachers. Join and attend as many meetings as possible. You will get a broad concept of what is being done currently in art education and instruction in the use of many art materials. These organizations provide bibliographies, instructural materials, and sometimes exhibitions. Use all of these services!

Teachers should use the workshop method of learning by doing. Do not be afraid to use the resource people in your community. Contact a nearby college and acquaint yourself with its services. If it cannot actually provide people to direct a workshop session it may be able to put you in contact with someone close at hand who can. Use your art consultant frequently — if you are fortunate enough to have one. Don't forget yourself. You have at least one project which you should share with others. Workshops are fun! Relax and enjoy yourself.

Start building up an art library or modernizing the existing one. There are many current books and magazines which can help you build an art philosophy as well as direct you in establishing a stimulating, effective art program. Every library should include these books and magazines. *The Arts in the Classroom*, Cole; *Creative and Mental Growth*, Lowenfeld; *Arts and Crafts in our Schools*, Gaitskell; *Creative Teaching in Art*, D'Amico. Magazines — *Junior Arts and Activities* and *School Arts*.

Since art is a visual experience every effort should be made to secure a variety of exhibits for the children to see. Many of these exhibits can come directly from the local school itself. Teachers at different grade levels can be responsible for an exhibit to be put in the hallway. Children themselves should have opportunities to handle and plan the display of the exhibit. If there is not enough space to display the work of each child then at least a small cross section exhibit showing the use of different

Make your exhibits attractive. Finger painting, crayon drawing, tempera painting, vegetable printing, and sponge painting were done by third graders.

media should be displayed. Each classroom should continually display work done by the children. Exchange and exhibit with a neighboring school. There are too many naked corridors and classrooms that could radiate activity by having art work on display continually.

Sell art to the faculty! Try to get *at least one* faculty meeting devoted to art. Be sure you know what you are doing here! If possible use a specialist or a teacher with a well developed philosophy and a record of creative art teaching. Films should not be overlooked in this situation. The importance of art is being felt and is growing throughout the country. Many educators and the public are beginning to see the value of art in the emotional and mental growth of the child. The teacher must be prepared to meet and stimulate this interest. Here are a few suggested films you might use: *Understanding Children's Drawings, Children are Creative, Exploring Art Series,* Bailey Films, Inc.; *Creative Hand Series.*

Art and Pupils

Art teaching is most successful when the teacher understands the developmental growth of a child. She should then plan her work in relation to his needs, interests, abilities, and the culture within which he lives. Cut and dried problems will not meet the needs of the students. Instruction should be flexible and informal. Each child should be allowed to develop at his own rate depending on ability, past experience, and individual imagination. Art experiences should be challenging to all children from the first grade on up. To provide this challenge, as many materials as possible should be used. They should offer the greatest possibility for creativeness and be adapted to the child's age level and his muscular development. These materials need not be only those ordered from art supply companies, but should include scrap materials which capture the imagination.

Picture making which is basic to any art education program should include the use of large paper (18 x 24 in.) and large brushes at least ½ in. wide. The use of newsprint is not enough. A variety of different surfaces will give different textures and results. Bogus paper, construction paper, wrapping paper, and wall paper samples are only a few of the types of paper which will challenge the creativeness of children.

Tempera colors such as red, blue, yellow, black, and white should be used at first and other colors added as the child continues to have further experience with color. Large crayons and chalk should also be used as alternatives to get the feeling of a different medium on paper. Sponge painting, paper tearing, finger painting, vegetable and linoleum prints, and silk screen printing are a few more techniques that can be applied to the two-dimensional surface. Children should participate in group activities and projects such as making murals, large designs, and decorations. Children love to paint and draw. It is as natural to them as learning to walk. The teacher should know when motivation is necessary. She should not be too critical of their work but have respect for what they have done and encourage them to experiment and to express individual ideas from their own experiences. There should be no ferreting out of the talented few. If this is done the exceptional child will become isolated, and the so-called less talented will withdraw within himself and lose confidence.

Crafts

Crafts should be considered a part of the general education of all children. The craft projects and materials to be selected by the children should be at the level of their ability. Children of the primary grade should work on simple, easy-to-construct projects which will give them confidence. Puppetry (stick, vegetable, hand, etc.) paper construction (masks, animals, designs, etc.) clay, weaving, stitching and simple wood objects, are challenging to this age level. If the craft program has been extensive in the primary grades then as this activity is continued in the upper grades unlimited materials and projects may be included in their experience. Work in designing marionettes, making the sets, and planning the costumes provide an exceptionally creative group activity. Other projects to be included in a craft program are: wood carving, block printing, silk screening on paper and fabrics, stenciling on paper and fabrics, clay modeling, pottery, weaving, stitching, rug hooking, toy making, mobiles, posters, and simple jewelry. The exploration, the problem solving, and the learning of the possibilities and limitations of the material should be the real meaning behind crafts. Certain basic instruction and guidance should be offered by the teacher to save time and materials that might otherwise be wasted. Good design which is fundamental in all craft work should be stressed. Regardless of how good the craftsmanship might be, if the object lacks honest, sincere expression of a creative idea it cannot be considered a work of art. If the design is not related to the material and to the object being made then the finished work will not be esthetically satisfying. Craft work is no doubt one of the finest activities that we have in our schools to develop social attitudes. Sharing materials and equipment, accepting responsibilities, cooperating and exchanging ideas freely with others are only a few of the social attitudes which develop through the well planned art and crafts program.

A variety of materials will stimulate the creativeness of any child. The mural shows funny faces being painted for Halloween. (Photo Frank Moon)

(Continued on page 92)

THE ROLE OF THE CLASSROOM TEACHER IN DEVELOPING BASIC COMPOSITION SKILLS IN THE JUNIOR HIGH SCHOOL

Hazel G. Gibson

Teacher of 9th Grade English, Western Junior High School, Somerville, Mass.

Everywhere today we hear complaints that the teaching of English is not what it should be. Business men and parents, too, say that our young people "write but they express nothing." "They don't know how to speak correctly and effectively." "They can't spell."

Maybe we English teachers *are* unfairly criticized, for all of use know that the effective teaching of the use of our language is a real problem and we are constantly seeking new ways of solving it. Experienced teachers know that in spite of our best efforts, pupil writing and speaking continues to be far from acceptable. Have we tried to teach too many things? Too few? Are we dulling the desire to write by drilling too much on the mechanics of composition? Or have we failed to sit down and determine exactly what skills should be taught to help boys and girls speak and write effectively according to their individual needs?

Let us consider what composition skills a pupil does need at the Junior High School level.

Effective skills in oral and written composition are developed by continuous attention at all maturity levels. Any skill that is taught at a lower level must be futher developed, extended, and refined at the secondary level.

All composition work requires thorough teaching of certain mechanics, such as good sentence structure, paragraph building, correct use of verbs and pronuons, vocabulary enrichment, punctuation, capitalization, and spelling. Therefore, these skills will not be repeated in the lists.

The following skills are suggested as a basic organization which will help a teacher to acquaint his pupils with information and situations as they relate to their present and future language experiences. Experienced teachers know what they plan to do, why they are doing it, and how they are going about it to produce the desired results.

Oral Composition Skills

Since speaking occurs approximately 100 times as often as writing, it is important that definite training and frequent practice in the following speech skills be provided for every pupil, that he may learn to express himself effectively, not only in school but elsewhere beyond the control of the school.

1. *Asking and answering questions.* Teach how to state clearly and courteously what he wishes to know. Pupils should learn how to choose words and formulate sentences that will give correctly the desired information called for.

2. *Carrying on a conversation.* (the ability to talk *with* others, not *at* them.) Teach them to speak correctly in a pleasing voice; stand and sit easily; listen attentively to the speaker; interrupt politely when necessary; follow conversational leads; try to include everyone in the conversation; ask significant questions about the subject being discussed; speak on topics of interest to the group as a whole; avoid gossip; introduce a new subject tactfully when interest begins to lag.

3. *Story telling.* Teach how to properly select and organize the content of a story; speak to an audience with poise, confidence, and enthusiasm; use correct forms of words and tenses of verbs.

4. *Giving and following directions.* Train pupils to trace in their minds a definite, clear, organized procedure that can be understood easily before giving directions to another; train them to listen carefully and mentally sort out procedure to be used in following directions.

5. *Telephoning.* Teach necessity of speaking slowly, distinctly and courteously; using telephone at the proper time and only for a definite reason; taking a message and delivering it accurately; following rules set up by telephone company for calling information, placing emergency calls, making a long distance call.

6. *Reporting and summarizing.* (book, movie and radio program reviews and reports on magazine articles.) Teach value of interesting opening sentence; making an outline preparatory to speaking; organizing material logically and clearly; giving exact information.

7. *Introducing people.* Provide many opportunities to introduce and be introduced socially; teach correct procedure; explain proper method of introducing a speaker or of being introduced as a speaker. Whether formal or informal, introductions are a part of every pupil's learning experience at every level of learning.

8. *Taking part in parliamentary procedure.* Teach rules for carrying on discussions according to parliamentary procedure; explain functions of chairman and other leaders

as well as rights and responsibilities of individual members to offer motions, to participate in discussion and to vote.

9. *Informal discussions.* Develop skill of participating intelligently and courteously; employing tact in dealing with others; listening to suggestions of others with an open mind; following the trend of a discussion with alertness; making contributions concise; asking discerning questions.

10. *Planning and presenting special occasion talks.* Finding necessary information; organizing ideas; outlining; presenting material correctly and effectively; gaining attention of audience; staying within time limit; using anecdotes and specific details.

Written Composition Skills

Teaching written communication has been one of the most difficult parts of the work of the English teacher. It is hard because it requires thinking and it takes persistence.

The only method by which skill in written expression can be developed is that of frequent practice in actual writing. Gradually, through practice, the ability to express

ideas in writing will improve. But it is the business of the teacher of English to provide the training in certain skills that will facilitate the process as much as possible. If boys and girls could be made aware that writing is only an extension of speaking, this part of our composition work would be much easier for them. Wherever it is wise to transfer an oral discussion into a writing experience, the the pupils will profit from such writing.

1. *Skill in simple outlining.* Teach how to organize and outline their material, selecting important points and placing minor ones in their proper places. Learn to organize notes on reading.

2. *Writing short paragraphs.* The average Junior High School pupil can say everything he wishes about most subjects in a short paragraph. Teach how to plan and write different kinds of paragraphs, (comparison, contrast, detail, example, repetition, cause and effect), developed from a topic sentence. Teach details of punctuation, grammar, and sentence structure to fit in with this kind of writing.

3. *Letter-writing.* (greatest opportunity to communicate with others.) Teach *when* it is important to write letters, (to thank one for a gift. to congratulate a friend, to write news of family to an absent member, etc.), as well as teach the proper form of social letters. Teach how to write business letters, (making and filling requests, ordering materials, making adjustments, sending out bills.)

4. *Filling out forms and applications.*

5. *Writing reports and announcements.*

6. *Writing minutes of meetings.*

7. *Writing directions and explanations.*

8. *News writing.* Become familiar with such types of writing as news stories, feature stories, and editorials and then practice writing these different types of stories.

9. Learn fundamentals of *unity, coherence,* and *emphasis* by frequent practice in application.

10. *Creative writing.* (for more gifted pupils.) Pupils who have no ability to do truly original work should not be *required* to attempt this kind of writing. Gifted pupils will be able to write themes—anecdotal, imaginary, descriptive—, short stories, essays, poetry, one-act plays, biography.

The teacher's own creative ability, her initiative and originality are necessary, of course, to bring about success in teaching these skills. Any and all material used should be enriched, adapted, or changed to meet the needs of the individual school, the teacher, and the pupil.

Bright and slow pupils alike need the preceding skills, although the bright ones will need them more greatly refined. Different children use different avenues of communication. The average and superior youngsters need a different battery of skills in written and oral communication than the slow learners. These brighter pupils will need emphasis or refinement of skills for discussion, organized oral thinking and writing. The slower ones need major emphasis on skills of conversation, oral skills of social usage, (such as telephone), and the listening skills. They will need to do very little writing in life outside of writing letters.

We must never forget that the major end of education for *all* boys and girls is to read as well, write as well, spell as well, and speak as well as he needs to in his given area of social living, whatever it is.

You cannot observe the waves of students passing through our colleges without questioning the aptitude tests and grades as an infallible measure of judgment, inventive capacity, imagination, the personality to influence people, or above all, the dogged persistence which carries many individuals to outstanding success. Memory and narrow specialization are given far too much weight in the entire educational grading machinery.—HARRY L. WELLS in *The Educational Forum.*

Al Capp seemed to me to be the most controversial speaker (at an NEA convention.) Everybody felt strongly that he liked him or didn't. One thing he said:

"I owe nothing to American schools. I'm not mad—I'm tired of being mad at them. They don't do any serious harm to happy, well-adjusted kids. But the odd kids, the troubled and maladjusted ones—I was one of them. These kids don't fit the school's pattern, and in my day the school got rid of them. They got rid of me. Revolt in my case took the form of cartoons. In the case of a boy I knew, it took the form of Communism."—CLYDE RUSSELL in *The Maine Teacher.*

ENTHUSIASM THROUGH SCIENCE IN THE ELEMENTARY GRADES

R. H. Cooper

Professor and Head of Science Department, Ball State Teachers College, Muncie, Indiana

It's fun to live in this world, and science can help teach us that fact. We might ask ourselves the question, "Science gives enthusiasm to whom?" We could answer it by saying that pupils gain enthusiasm by working with science; teachers gain great pleasure and refreshment in its presentation; administrators get satisfaction from seeing science well-taught in their schools; and parents may be delighted with the interest carried over into the home and living in general. Pupils often express their enthusiasm for science by showing unusual cooperation and initiative. The teacher may express his enthusiasm by showing increased spirit, added joy in teaching, and a sense of lack of monotony. The supervisors, consultants, principals, superintendents, trustees are pleased with the contagious interest shown through science enthusiasm. Parents often speak cheerfully of the experiment that "Mary" or "Milton" did in the kitchen the evening before the Parent-Teachers Association meeting.

One could cite many instances of the carry-over from elementary science to the home. One boy whose interest in science was kindled in the sixth grade carried that interest through home and school life and on into college. A father made the remark that he could not go to a certain meeting because his daughter needed to work on certain science material and he was planning on working with her. A young boy phoned a member of the science department recently and asked how he might keep turtles, salamanders, and frogs through the winter. A girl asked for suggestions of books to purchase for the home which would help her in the study of birds. Two sisters formed an attachment for a beautiful tree frog, and their physician-father became interested enough to photograph in kodachrome movies of the little amphibian eating large cockroaches. A young lady became interested in snakes and maintained that interest at school and at home for many years. A girl and her mother drove many miles this fall to bring a larva to a teacher of science for identification. A WAC who has been interested in physical therapy gained her initial inspiration from simple science work. Letters, phone calls, visitations, and expressions by parents give concrete evidence of genuine interest in science carried over to the home and on to the pupil's development in later life.

Moving Enthusiasm for Science

What can a teaching staff from all grades (1-12) do to make a little more sure of an all-out enthusiasm for science? Let us assume for our thinking together:

1. That there is a teacher conviction as to the need for science in the elementary grades.
2. That there is a teacher respect and enthusiasm for children's interests.
3. That all persons in the classroom have a right to learn together. There is a question whether children learn from teachers who are not learning.
4. That any teacher in any locality in any type of set-up can plan and teach science if there is a willingness. There is such a thing as science readiness for teachers.
5. That no one is to be humiliated because of errors, but that corrections will be worked out together in a sincere and courteous way.

If these conditions exist the teachers, with the administrators, can get together those who are interested and plan a reasonable, concrete, long-range program. They can invoice in a simple, concrete way what has been taught recently by them in science, what teaching aids are available, and what simple procedures they have used with success in teaching science. They can agree together in a simple way what subject will be taught and/or what textbooks will be followed. They can agree on minimum teaching materials needed and secure what is possible to get. They can agree on a simple form for setting down outlines for the teaching of units—e.g., a few major purposes, a subject matter section with two columns, one for understandings (facts they hope the pupil will understand by the time they have finished the unit), a parallel column for activities (concrete experiments and work outside the classroom), a section for lists of teaching materials needed (texts, supplementary books, audio-visual materials, and equipment), and a list of short samples of ways to evaluate the teacher's success in teaching the unit. They can prepare a short, practical, simple science manual which would show samples of ways to do science and which would stress the teaching use of the local environment. They

can get together occasionally each year to talk over the science program. Such meetings should not necessarily call for more lengthy writing.

This simple procedure should result in a planned—not regimented—science program from kindergarten through twelfth grade which would have the support and understanding of most teachers.

Using the Environment

How can the use of our environment increase enthusiasm for science? Careful planning for work outside the classroom is essential. It is necessary to plan carefully before going. It would be best to use wisely the time enroute if traveling any distance and to use wisely the time at the place of study. Upon return from the out-of-classroom study immediate and concrete use of the information and materials should be made as well as a follow-up by group evaluation. Recently the author was called to a local school to work with a sixth-grade group. Previous to the time of this specific teaching, the children had worked outside the classroom and gathered materials which had to do with the topic to be worked out together. Enthusiasm was high, the purposes were definite, cooperation was most evident, and initiative was of a very desirable type.

Materials for aquaria, terraria, and other types of projects which make for good science atmosphere in the elementary room can be gathered and used wisely by careful planning of the work outside the classroom. City parks have been mapped and those maps accompanied by written material point out to the teacher places of interest and give information about the living things in that area. Careful planning such as has been done by many will cause teacher and pupils to observe more carefully the common but interesting things about them.

The use of our environment can increase enthusiasm for science because actual materials are brought into the classroom for study and observation. Reports are not written and read or studied and given in an abstract way. The very appearance of the room is stimulating because it "smacks" of science itself.

Enthusiasm for science can be increased for girls and boys through use of classroom experiments to "find out what happens" if:

The experimenting is a "we" proposition.

The teacher avoids an "I am going to show you" attitude.

The teacher avoids saying "It's supposed to."

The approach is a "We want to see" situation.

By following such procedure it is possible to work together to find out what happens, and all are responsible for seeing that the experiment is done well. All then want to see together and do not tell one another ahead of time what is supposed to happen. A research approach is developed. The process of discovering is used — even discovering incorrectly. What is seen is recorded honestly.

Scientific Research Attitude

Some genuine, lasting enthusiasm may be initiated and increased by helping children to take a scientific research attitude. What are some characteristics of this procedure?

The teacher will call attention to the need for the use of controls and suggest ways of using controls in simple experiments. Instead of just burning a candle in a closed fruit jar he may require the pupil also to use an open jar with a burning candle in it for compariosn.

The teacher can provide opportunities for pupils to go beyond the experiment or project being studied. Pupils can be permitted and encouraged to do the experiment assigned for observation, and they can be asked to learn other ways of showing the same or other facts with the equipment at hand. If the students have been encouraged in the past and over a period of time to do this they will often go ahead on their own initiative and find other ways of demonstrating the facts being studied. The author has seen classrooms where this has been tried. Children have

volunteered quickly to show experiments that they have been able to perform which were not suggested — experiments they performed with the equipment being used.

Aids to Science Teaching

There are a few simple aids which most teachers would find helpful such as:

Tree Finder by May Theilgaard Watts, Nature Study Guild, Naperville, Ill.
The Star Explorer, American Museum of Natural History, New York City.
Weather Forecast Computer, Taylor Instrument Company, Rochester, New York.

Each of these costs $0.25. They may be classified as special devices to help.

Some teachers would want a minnow net and pail for collecting local aquarium materials such as tadpoles (winter or summer), native fish, algae, and other underwater plants; some baskets for collecting local tarrarium material; some small, tight cages; and a compass such as those sold by Silva, Inc., LaPorte, Indiana, for learning and enjoying ways of getting around in our environment.

Skillful use of bulletin boards can increase the enthusiasm for science in the elementary classroom. Some teachers have chosen to call certain types of these "living bulletin board displays." These can be constructed with either plant or animal life. It is possible by using large pyrex test tubes, size 1 in. x 8 in., to arrange interesting miniature aquaria on the bulletin board and label them. These can be held in place by using twine and thumb tacks or by using scotch tape around the tubes and thumb-tacking it to the bulletin board to hold. It is possible by such procedure to show an aquarium where the snail's habits are emphasized, a miniature aquarium where a tiny fish is being observed, a miniature aquarium where some water insect is observed. A number of these may be shown in mature or immature stages by using several test tubes. It is necessary to have underwater plants in these miniature tubes. It is possible to fix a bulletin board that is interesting by using the same type of glassware and making a display of seasonal flowers, either wild or cultivated. Such material should always be neatly labeled. A clever title, perhaps, of letters cut out of paper add to its interest. At certain seasons of the year it is interesting to use tinted flowers such as Queen Anne's Lace, which may be colored red, blue, or yellow, or some other color by crushing colored chalk in paper sacks, putting the heads of Queen Anne's Lace in the sack and shaking it well. It is possible to use dried weeds such as teasel, milkweed, primrose, and others on the bulletin board when very few plants are alive above ground in the northern latitudes. These may be colored or used dry. Either way they are most interesting.

Some special attention needs to be drawn to the bulletin board. It is possible to make the bulletin board a growing type of thing. Some classroom teachers have used a silhouette of a tree, perhaps in the school lawn, and following that tree through the seasons have put on the silhouette in the classroom cut-out material which similate blossoms, buds, young leaves, mature leaves, and fruit in succession. A bulletin board can be a very interesting spot in the classroom and may relate directly to science. It can be a lively, cheerful thing rather than one where clippings that have been saved for many years are routinely placed on the same bulletin board year after year and sometimes more than once a year. Children like to help in using this type of science. It lends cheerfulness and enthusiasm alike to teacher, pupils, and visitors.

A great deal of enthusiasm may be gained by using some of the excellent physical science films for various grade levels. "Flow of Electricity," "Magnetism," "Science versus Superstition," "Things Expand When Heated," "We Make a Fire," "What Is Science?", "What Is Soil?", "What Is Sound", "What Makes Rain?", and the Walt Disney film entitled "History of Aviation," are very interesting films and can be used to great advantage. "Indiana Has Almost Everything," can be used in that state and perhaps others. "The Air Age," from the Idaho State CAA can well be used to show conservation by air as practiced in many of the states of our country. "Insects Are Interesting," "Praying Mantis," "Monarch Butterfly," "Flying Colors," and "Cecropia Moth," are very interesting colored movies in the field of natural science which are suitable for elementary children. Visual materials can add much to the enthusiasm in the elementary school room.

Like other work, the teaching of science needs the teacher's best efforts and careful thinking in order to develop the most enthusiasm for all. Science is naturally objective. It comes from the concrete things in the child's natural environment. Science is full of opportunities for those who have loyal interest in the children of the world. If you haven't already done so, try getting the thrill of using planned science in your regular classroom program.

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SKILL DEVELOPMENT IN THE LANGUAGE ARTS

Mary McClenaghan

Supervisor Kindergarten, Primary Education,
Tulsa Public Schools

Language is generally recognized as the basic tool in learning. Proficiency in reading, listening, speaking and writing is fundamental to satisfactory achievement in most subject fields. Ability to make effective use of these language arts is practically synonymous with study, and time that is carefully planned and thoughtfully spent by the teacher on the development, refinement and application of language skills of his pupils pays dividends in more efficient study and greater achievement in other subjects.

Equally as important is the idea that language is basic to happy, personal living. To live hapily with others requires mutual understanding. Inability to communicate precisely and accurately results in misunderstandings that sever friendships and develop frustrated personalities.

In another area of living, proficiency in language is necessary. The intelligent use of all aspects of language is essential to effective participation in a democratic society, and without proficiency in language one cannot fulfill his citizenship responsibilities. In a democracy the rules by which people live come from those people, themselves. Those rules evolve from an interaction of ideas of the individuals who make up the people. Ideas are gained through intelligent and critical reading, listening, observing. They are shared with others through precise, exact and persuasive speaking and writing. Only through this interactive process of gaining, pooling and sharing of ideas can democracy function.

In view of the supreme importance of the language arts for living and for learning, careful consideration needs to be given to the approach in teaching them. Their development cannot be left to personal whims or opportunistic teaching.

There are those who believe that the language arts should be taught as they function in a unit of work. The contention is that varied activities throughout the day furnish a natural context and strong incentive for reading, listening, speaking, writing, and spelling, and that the arts of language will normally develop in such situations. The writer finds no fault with this idea and would strongly urge the complete utilization of every normal situation for the refinement and application of the skills of language. On the other hand, the writer believes that organized, systematic, sequential teaching of skills in each of the language arts is necessary.

Reading

In the Tulsa Public Schools, a dual program in reading is provided. A basal reading program is developed through the primary grades with a particular reading series. The lesson plan as given in the teaching manuals is followed closely. Levels of instruction have been determined, and each pupil advances through the various levels at his own rate. All pupils begin in first grade in Level 1 in which pre-reading, readiness materials are used. They advance to succeeding levels as readiness is acquired for them. Small-group instruction makes it possible to adjust to the needs of individual pupils. At all times thoroughness is the aim and pupils are challenged to their fullest capacities, but they are never forced into levels of development or materials that are beyond their understanding.

The child's progress through the levels of development is recorded on an individunal reading record card. This card has been of great value in informing the succeeding teacher of the levels of materials read, and also in acquainting parents with progress of pupils. These cards accompany other records in transfer, which enables the receiving teacher to know the level of reading material required by the child.

Parallel with this basal program, language arts development is further provided within an integrated program of social studies, health and personal development. Units of work which relate to the school, home, and community interests are developed from the kindergarten through grade three. In each unit definite objectives are set up to include both content objectives and skill objectives in laguage arts. In first grade the extended reading is based largely on experience reading, but in grades two and three wide reading is done in material related to the unit. Provision is made in the social studies guide for classification of these reading materials into advanced, medium and easy materials to provide for the proper developmental level of pupils.

Spelling and Handwriting

The dual program is also applied to spelling. Every situation that involves writing by the pupils becomes a spelling lesson, but the use of a spelling list begins in grade two. Word lists for both grades two and three have been compiled from words which children have requested in their writing with additional words being supplemented from recognized word lists. A manual for teaching the daily lessons is used by teachers. Important skills in developing word meanings, visual and auditory perception are included in each lesson. Opportunities for using the words within functional settings are provided.

These children are enjoying reading library books.

As in reading, the spelling instruction is adjusted to meet the individual abilities. Records of the progress made by individual pupils are kept in the test tablets. Squared paper is used and the number of squares colored indicates the number of words spelled correctly.

Manuscript writing is used in primary grades, with the transition to cursive writing being made in grade three. Cursive writing is first introduced during the second nine weeks of third grade, but not used as a writing tool until late in the year, when pupils have some control of the cursive writing process. Instruction for developing manuscript and cursive writing is included in teacher guides. Directed lessons are presented each day in a separate time allotment to insure proper attention to writing. Wide line paper with five-eighth inch ruling is used through grade three, and a medium size primary practice pencil. In all written activities, pupils are expected to maintain a high quality of writing. Neatness, accuracy in letter formation, legibility are qualities which are expected. Pupils understand that their marks in handwriting in the reports to parents are based largely on the quality of writing in these functional situations.

Speaking and Writing

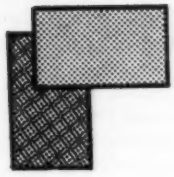
Language textbooks are used in two ways in grades two and three. Directed lessons are used in which attention is given to sequential development of the various language skills. Adherence to the texts makes it possible to feel reasonably sure that important skills are not being omitted. The texts are also used as certain information and skills are needed for functional purposes in speaking and writing.

Application of language arts skills in unit work in social studies, health and personal development is effective because of the thorough development that is provided in the systematic skill program. At each grade level suitable language activities are carried on with confidence and security because of the previous development. The many interesting experiences in the social studies enable children to have needs for writing. Letters, invitations, records, summary reports, and stories are representative of the many opportunities which occur.

Children enjoy writing original stories, poems and other phases of creative writing. They write out of their background of experiences, and because they have something to write about. To aid in their writing many teachers like to use word books, small booklets which pupils make for this purpose. As needed words are requested by the pupils, the teacher writes the word in the booklet. In this way, the pupil has a list of words which can be used in his writing. Frequent references are made to these books for needed words. Reading as well as writing vocabularies are increased through this plan. It is from such lists that the spelling word lists are compiled.

Skills in language arts are essential and must be thoroughly developed. Incidental, unorganized teaching is not adequate. If pupils are to be prepared for the responsibilities which they will be assuming in the tomorrow, then the school must provide for the kind of instructional program which will equip them to use the tools of learning effectively, and also to be able to live as a worthy member of our democratic society.

Developing readiness for the unit on "Pets." This is a group of second grade children talking about farm experiences, and making plans for the study.



GROUPING FOR READING IN THE SECONDARY SCHOOLS

Rosemary M. Green

Special Assistant, Secondary Reading, School District of Philadelphia, Philadelphia, Penna.

Grouping is a word which has the power to strike terror into the hearts of many secondary school teachers. The term conjures up mental images of widely scattered groups of students working independently of the teacher without adequate supervision or restraint, a wide variety of materials, and a general atmosphere of unrest and confusion. The word suggests, also, a technique usually associated with the elementary grades and, therefore, somewhat suspect at junior and senior high school levels. None of this need be true if certain simple but fundamental principles are understood and put into practice. The purpose of this article, therefore, is to describe several plans which have proved successful in some secondary school classrooms of our city.

The necessity for some type of grouping for purposes of improving the reading of today's high school students is obvious. A teacher need only make the most cursory examination of the cumulative records of her students to recognize the truth of this statement. In an average heterogeneous secondary school class the reading range will be at least five or six grades without counting the occasional "non-reader" or primer level reader at one end of the scale. In addition, there will be the problem of the range of mental abilities from the slow learner to the gifted along with the usual assortment of emotional problems of all kinds. Blind and irresponsible indeed would be the teacher who could close her eyes to these facts and proceed with instruction of the whole class as a unit in the skills areas.

Basic Principles

Therefore, for the conscientious teacher who feels keenly the necessity for some degree of grouping but has misgivings about the wisdom of plunging into the work, the following basic principles are set down:

1. It is possible to obtain results in the improvement of reading achievement *only* if the students are working at or, if necessary, slightly below their individual instructional levels.
2. It is important to develop techniques for ascertaining instructional levels for a large class of students which are simple to use and economical of the time and energy of the teacher.
3. It is necessary to plan carefully in advance the work of the various working groups preferably for a considerable period of time.
4. It is necessary to obtain an adequate supply of materials at appropriate levels of difficulty.
5. It is advisable to enable students to evaluate their own progress through a simple but valid testing program.

Before the teacher reading this becomes too alarmed by this rather formidable array of basic principles, let me hasten to add that their application in the classroom situation can vary from a simple approach to grouping to a highly complex and almost individualized program. Since any detailed description of all these types would not be within the scope of this paper, the comments that follow shall be confined to a description of two plans representing almost the extremes of simplicity and compleixity.

Plan I: Simple Grouping

Basic to both plans for grouping is some type of class study or group inventory to use a more descriptive and, possibly, a more technical term. In other words, the teacher must find in the most efficient way the levels of achievement which her pupils represent in reading, writing, and spelling. A brief and highly condensed version of the steps in a group inventory used successfully in our secondary school classes follows:

Reading Inventory

1. Check on general language facility of group, e.g. response to questions of general information based on material, ability to respond orally, vocabulary level (choice and use of words). Note those who fail to participate for further study at a later time.
2. Check on comprehension and rate (through written response to questions based on story and, orally, through discussion of story just finished. Written, obviously, should precede oral).
3. Check on rate (through notation of general speed of students – those finishing first, those not finishing at all during the period, manner of attacking assignment. Remember, this is a group not an individual check of rate).
4. Check on word recognition techniques.
5. Check on ability to adjust type of reading to purpose of reading.

6. Observe very carefully way in which students read: note any symptoms of eye defects, poor posture, restlessness, inability to concentrate, other signs of frustration including lip movements and audible vocalization.

Writing Inventory

1. Be sure students understand the purpose of this activity and emphasize the importance of doing "their best work."
2. Read or tell short anecdote, story, or fable to the class.
3. Have group write the story in their own words. (If fable is used, it is a good plan to require students to supply the moral.)
4. Pupils proofread to correct errors to the best of their ability before handing in papers.
5. Teacher checks pupils' competence in writing skills—
   a. Factual content.
   b. Paragraph structure.
   c. Sentence structure.
   d. Punctuation.
   e. Vocabulary.
   f. Spelling.
   g. Handwriting.

Spelling Inventory

1. Administer test of twenty words selected from Grades 4 to 6 of the elementary school spelling list.
2. Administer second test of twenty words selected from Grades 1B to 3B to those with less than 50% correct in first test.
3. This rough screening will give approximate levels. Individual levels must be ascertained by further sampling. Check results on spelling tests with achievement in writing inventory.

Physical Disabilities

Check evidences of difficulties in *speech* and *hearing*, in addition to those mentioned in the reading inventory. The information gained from this procedure when combined with that to be found on the cumulative record cards of the students will provide the teacher with the kind of information which she must have to plan her groups in the skills areas. The more simple approach of Plan I, is based upon the idea of beginning work with the entire class as a whole on a series of lessons which from experience, we know will be of benefit to almost every student

in the average class. For example, one such series which might be classified under the general heading of directed reading could be developed with the idea of "how" to do such types of reading as: general comprehension, reading for the main ideas of a story or of a single paragraph, reading for details, and outlining. Another series might deal with the skills of independent word attack which, it would seem, are needed in some degree by all secondary school students. This fertile field could embrace the "how" of analyzing words phonetically and structurally, of using context clues to get meaning, and of using a dictionary efficiently and effectively. This latter area alone offers unlimited opportunities for further work in the field of vocabulary development some of which could be done with the class as a whole but much of which could be individualized.

As these lessons progress, a kind of grouping begins to take place automatically and almost without effort on the part of the teacher. Her part lies in watching for signs of differences to appear and capitalizing upon them in the direction of grouping. For example, as the better readers consistently finish silent reading assignments before others in the class, the alert teacher will provide other activities (perhaps as simple as a leisure reading book to be picked up) for them. Before too long, it should be a simple matter to give this top group of students a different assignment using higher level material right from the beginning of the period. Since these students usually have better motivation and a keener interest in reading than the others, they can with some encouragement be depended upon to work profitably and for fairly long periods of time on their own. More slowly, perhaps, but equally as surely, the very slow readers (either the mentally limited or the really retarded readers) will become apparent. With this group, the teacher is in a position also to differentiate her instruction through the use of easier reading materials and a disregard for the element of speed in their work. By means of special assignments along with a sensitivity to the needs of this group of students for teacher guidance and direction, another working group can be painlessly and easily formed. This will leave a large "middle" group of students who can profitably work together in activities related to the development of skills, but can and should be encouraged to make individual reading choices in the field of literature and leisure reading.

Plan II: Varied Grouping

Actually the plan for a more complex type of grouping differs in degree rather than in kind from the simpler approach described above. It is initiated by a more thorough study of the class through the inventory technique and the use of that study to set up as many groups as seem necessary to care for the varying instructional reading levels of the students. This would vary from three to five, six or even more if some attempt at individualization is going to be made. Except for the preliminary planning lessons, the class from the beginning of the term would be divided into working groups of various sizes for purposes of improvement in the skills of reading, writing, and spelling.

There are two cautions to be observed in attempting this type of varied program. One has to do with the absolute necessity for the most careful pre-planning with students in preparation for the work. The purposes of working in this way must be made clear to the students and their responsibilities in this admittedly more difficult situation from the standpoint of control discussed. It is important, also to establish the reason for the differences in the reading or writing achievement which exist within the class and the necessity for beginning at instructional levels to insure progress. The second caution to be observed is related to the need for flexibility in the grouping set up at the beginning of the term. Obviously, a grouping based on class records is subject to revision as a teacher gets to know her students as individuals. There should be no

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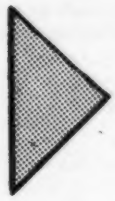

DEVELOPING THE ABILITY TO COMPUTE MENTALLY

Harold E. Moser

State Teachers College, Towson, Maryland.

Those who follow the literature of the teaching of arithmetic are beginning to find more frequent mention of mental arithmetic. Now the term, *mental arithmetic*, is not a newcomer to the technical literature of the field. It is to be found with varying degrees of emphasis in almost all of the textbooks of the past century and a half. Over the years the educational importance of mental arithmetic has waxed and waned with each new educational philosophy that appeared on the scene. *Mental* arithmetic in a program dedicated to *mental* discipline, for instance, was characteristically different from mental arithmetic in the days when teaching was so strongly influenced by connectionism. Apart from differences in materials and philosophy, the outstanding feature of mental arithmetic has always been computation without use of the written algorism and such will be the broad frame of reference in which the term will be used in this discussion.

At the present time the importance of mental arithmetic is being greatly enhanced by the popular swing toward meaningful arithmetic. The importance of mental arithmetic in this frame of reference stems from a belief that arithmetic is more properly a system of thinking than a body of content to be memorized. Since effectiveness in quantitative thinking depends upon the richness of number ideas, much effort is going into the planning of classroom activities that will help children to discover useful and effective ways of thinking about number.

This paper was presented at the summer meeting of the National Council of Teachers of Mathematics: Kalamazoo, Michigan; August, 1953.

One of the most promising and helpful of the recent developments in the approach to mental arithmetic has been a gradual awakening to the fact that most people do not think about number operations the way they work them out when using paper and pencil. This difference is noteworthy because it comes about in spite of the classroom teaching rather than because of it. It has been the accepted practice of teachers in the past to teach each number operation, such as the multiplication of whole numbers, with a highly conventional pattern of number arrangements (the algorism) and certain invariable procedural sequences. This close association between process and algorism was strictly maintained from grade to grade. As new work was introduced requiring the use of larger magnitudes, the algorism grew in complexity and the number of procedural steps grew in length. The general pattern, however, remained the same.

Since each number operation was so closely identified with a particular thought pattern and written algorism, it was not surprising that children attempted mental solutions in the same way in which the process would have been written. The results were usually unfortunate because the conventional algorism was meant to be written. Each mental solution attempted in this manner surrenders certain special advantages that the algorism was designed to give and in this way mental computation becomes something of a handicap performance, like trying to accomplish with one hand an operation normally requiring two and without making any methodological concessions to the fact that only one hand is available. Let us see why this is so.

Written Arithmetic

The written algorism is analogous to a machine. It is the modern improvement of the abacus. Number operations are performed and recorded systematically order by order and the final result is assembled at some designated place. It offers the operator two important advantages: (1) Complicated examples are uniformly broken into simpler sub-parts so that ultimately only a knowledge of the basic number combinations is needed to perform the operation. (2) The pattern of placing the numbers relieves the operator of the necessity for attending to the order values because the algorism takes care of the size of the values being handled. Thus for example, in $\begin{array}{r} 43 \\ +\ 35 \\ \hline \end{array}$ one need not say, "Three *ones* and five *ones* are eight *ones*; four *tens* and three *tens* are seven *tens*." We simply need to say: "3 + 5 are 8, 4 + 3 are 7." The ultimate effects of these combinations on the final result are regulated by the algorism. These are tremendous advantages but these advantages are lost when the process is not written. At least four special difficulties come to mind.

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1. As the operator works order by order it is difficult for him to follow the changes in the quantitative situation as a whole. Furthermore, the restricted area of activity usually moves in the reverse order to the way numbers are read. The attention required to keep the activity moving makes an over-all survey of the emerging solution impossible in most instances

2. The demands upon powers of visualization and memory are beyond the reach of all but a few. Without sustained attention to the column arrangements the operator is certain to lose control of the order values. When this difficulty arises transportations in order values often become the sources of errors which are not easily detected unless the result is absurd. At other times order values are forgotten completely thus necessitating a fresh start. Experience has shown that the physical energy needed to attend to all parts of the example progressively, while retaining the results of the parts completed, is sufficient to cause most persons to avoid mental computation except under conditions of unusual motivation.

3. The written algorism, like most mechanical devices, attacks each example in precisely the same manner. Such an approach usually glosses over the uniqueness of the numbers under surveillance. This point may be illustrated by the example 48. The multiplier (25) is so in-

$$\times 25$$

timately related to 100 that it is easier by far to multiply mentally 48 by 100 and divide the product by 4 than to work with the partial products in the conventional manner. An analogy from social living may help clarify the point. Social behavior is pretty thoroughly regulated by convention and yet the socially skilled person finds considerable latitude for responding to the unique aspects of each social contact. One of the facets of intelligent social behavior is the capacity to perceive differences and to alter behavior accordingly. Intelligent behavior in quantitative situations could hardly be expected to be less discriminating.

4. The written algorism is oriented toward exact answers. The right to left sequence usually followed means that the most significant aspects of the quantitatve situation are reached at the very end of the operation. For purposes of estimation the written algorism is almost useless. If we accept the current thesis that there is more need in social living to think about numbers as approximations than there is to compute for exact answers then we are forced to admit that a whole area of social need is not being serviced.

Thinking about Numbers

It must be emphasized that the objections just reviewed pertain to the use of the written algorism for mental computation. There is no implied suggestion of omitting techniques of precise computation with paper and pencil. These devices will always be needed because there is no set of principles that will permit the average worker to solve all types of examples at the mental level. The issue is rather one of establishing a better proportion between the ability to think about numbers understandingly, and skill in performing the mechanical operations. Thus far in our classrooms we have attempted to make the latter serve both purposes and the results have not been satisfactory. We need to know more about teaching effective ways of thinking about numbers.

A problem as fundamental as this should be the proper subject for careful educational research but until such studies are available we shall have to be guided by theoretical consideration supplemented by the practical experiences of teachers who try out various experimental devices in their classrooms. It is from sources such as these that the following considerations are offered for improving children's ability to compute mentally.

An understanding of the structure of the number systems is essential to success with mental arithmetic. Mental operations are not to be taught by rules. We would only be compounding past mistakes if we were to set up a hierarchy of mechanical procedures to be memorized. Ways of thinking about number are discovered by children as they engage in a study of the number system. Only three number meanings are needed to develop a variety of useful devices for handling number operations mentally.

A. Numbers are made up of other numbers–the component parts idea.

B. Every number is a member of a series–the number scale idea.

C. Numbers may be measured by other numbers–the ratio idea.

Mental Arithmetic

The usefulness of each of these ideas for mental arithmetic will be considered in turn.

1. One way to relieve some of the difficulties that arise when children attempt to use the written algorism mentally is to break numbers into their component parts and to work with each of the parts in turn. Answers to the partial solutions are then put together. The 4 in 450 often can be dealt with more effectively if thought of as 400 rather than a 4 in the third order. The example $450 \div 2$ is solved in two parts $400 \div 2 = 200$; $50 \div 2 = 25$. The quotient is 225. Other processes can be handled in a similar manner.

$$\begin{array}{r} 48 \\ +\ 55 \\ \hline \end{array}$$ Think: $55 + 40 = 95$; $95 + 8 = 103$

$$\begin{array}{r} 52 \\ -\ 25 \\ \hline \end{array}$$ Think: $52 - 20 = 32$; $32 - 5 = 27$

$$\begin{array}{r} 32 \\ \times\ 9 \\ \hline \end{array}$$ Think: $9 \times 30 = 270$; $9 \times 2 = 18$
$270 + 10 + 8 = 288$

Although the procedure just outlined involves remembeing the results of several part solutions, it is generally conceded that these part answers are less difficult to remember than a series of digits in column arrangement. There is one further advantage. In most instances the operator computes from left to right. The first part solution, therefore, supplies a reasonable approximation of the result to be expected. The contribution of any further step serves to refine this original estimate. In this way the solution to each quantitative operation is built up as an

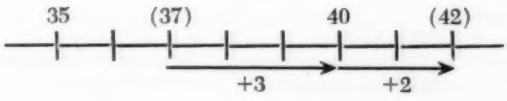
intelligent whole and the operator is always in a position to evaluate the emerging result.

2. The geometric concept of number (scale idea) is a useful mental aid in addition and subtraction. Its effectiveness is especially evident in situations requiring reduction ("carrying" or "borrowing"). Studies of children's difficulties in written examples reveal that a considerable proportion of the errors are associated with the numbers to be carried or borrowed. In mental computation where there is no visual reminder of the work completed or adjustments made, the incidence of errors in this area must be correspondingly greater.

When children have learned to think of the operations of arithmetic as progessions, forward or backward, along the number line, a system of bridging gradually replaces the reductions used with the written algorisms. This system of progressions with bridging is still more effective when combined with the component parts principle mentioned earlier. In the following example the principle is illustrated with a higher decade addition combination.

$$\begin{array}{r} 37 \\ +\ 5 \\ \hline \end{array}$$

Mental procedure diagrammed:

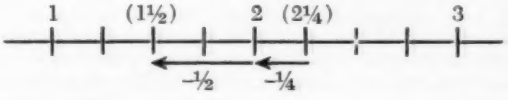


Possible verbalization: "Thirty-seven to 40 will use 3 of the 5 to be added. Two more are needed to complete the 5 and so the sum is 42."

In subtracting 5 from 42 the procedure would be similar but the direction would be reversed. 42 – 2 = 40; 40 – 3 = 37.

The number scale is even more rewarding when working with common fractions because often the number of reductions needed to work with the fractional algorisms is greater than for the corresponding processes with whole numbers. It may be assumed that the opportunity for mental confusion is increased accordingly. In the next example first think of the steps needed in the written operation and then compare the procedure using the number scale.

$$\begin{array}{r} 2\frac{1}{4} \\ -\frac{3}{4} \\ \hline \end{array}$$



Possible verbalization: "Moving from 2¼ to 2 subtracts one-fourth. Two-fourths more (½) must be subtracted and so the remainder is 1½."

Experience with the number line and the bridging technique often leads to further refinements in procedure. These differentiations come as discoveries of children and they are suggestive of the wide range of opportunity for individual differences that are possible in the application of the principles just reviewed.

As children add and subtract with attention to bridging 100 they will learn many of the complements of one hundred. A knowledge of these special combinations may make it possible to attack solutions in larger segments.

Example A

$$\begin{array}{r} 110 \\ -\ 35 \\ \hline \end{array}$$

Possible solution: "Thirty-five from 100 leaves 65; 65 + 10 is 75."

Example B

$$\begin{array}{r} 185 \\ +\ 25 \\ \hline \end{array}$$

Possible solution: "One hundred eighty-five and 15 are 200; 200 + 10 are 210."

Compensatory adjustments provide a slightly different type of refinement. They are especially helpful when one of the numbers is near a bridging point.

Example C

$$\begin{array}{r} 500 \\ -\ 298 \\ \hline \end{array}$$

Possible solution: "Two hundred ninety-eight is almost 300; 500 – 300 = 200. Since I have subtracted 2 too many I shall add 2 to 200. The difference is 202."

The futility of teaching children these special cases by memorizing rules of procedure must be apparent to all. In classrooms where teachers give special attention to meaning and ways of thinking about number, the children capable of using such refinements will discover them; those who do not readily see the more subtle relationships should be permitted to use the more obvious applications of the principles of mental computation.

3. The last in this group of general mathematical principles found to be useful in setting up a system of mental computation is the ratio meaning of number. Teachers generally agree that this important concept is difficult to teach and it is unfortunate that it is so poorly understood even at the high school level. It is likely, therefore, that some special preparation will have to be made in most classrooms before the ratio idea can be made to function fruitfully in mental computation.

The ratio principle permits the operator to derive products or quotients by comparing the factors in the example to be solved with related multiplications in which the products are already known or easily secured. Thus, 20 x 32 may be built up by first finding 10 x 32 (320) and then doubling the product obtained because 20 is twice the multiplier first used. Similarly, a number that has been divided by ten and then halved has been divided by 20.

It may be argued that there is nothing new or unusual in this line of attack because the suggestion merely appropriates, with a slight language variation, what already is being practiced in the written algorism. This observation is, of course, accurate. The various algorisms employ both the principles of distribution and association (which are used in connection with the component and ratio ideas under discussion) but children who perform written operations by procedural directives do not see these principles at work and there can be little hope for transfer to mental

computation on the basis of experience with the written algorism.

Multiplication and Division

Special classroom activities are needed to develop alertness in discovering number relationships in multiplication and division situations–just as special instructional devices are needed to familiarize the children with the techniques of handling the scale idea or the component idea. The following exercise is offered by way of illustration.

> Teacher to class: "Sometimes the products of completed multiplication examples can be used as a short cut for working new and different examples. Who can tell how to use the completed multiplication in the first column to find the unknown product in the example to the right?"

15	15
× 4	× 12
25	25
× 8	× 16
35	35
× 100	× 50

Such examples should be graded in complexity to fit the level of ability of the class. In later exercises the examples in the first column would be omitted and the children would be asked to think of an easy multiplication that would provide a short cut solution to the example shown.

Again there are many opportunities for meeting individual differences. When a pupil has learned to utilize the power of ratios in finding products and quotients in the more obvious examples, he may then discover ways of dealing with multipliers that are "almost" multiples of ten.

Example A

12 Possible solution: 10 × 12 = 120; 120
× 21 doubled gives 240, 240 + 12 = 252

Example B

15 Possible solution: 10 × 15 = 150. 150
× 19 doubled gives 300; 300 – 15 = 285

The principle of compensation will add further scope to applicability of the ratio idea.

Example C

24 Possible solution: 24 × 100 = 2400;
× 25 2400 ÷ 4 = 600

It is readily admitted that multiplication and division performed with the help of easily handled ratios involves subtleties of thinking not found in the first two principles. It is also the most specialized of the lot since its practicality for mental computation diminishes sharply when multipliers are encountered that are not easily associated with a multiple of ten or one hundred. However, the importance of comparison by ratio in everyday social experiences makes it imperative that this valuable mental aid be made available to all who are capable of understanding the concept. No system of mental computation would be complete without some provision for discovering and taking advantage of the relatedness between groups of numbers.

Advantages of this System

An evaluation of the system of mental computation just outlined will disclose four important virtues:

(1) The system is built upon a small core of number ideas. Procedures that are derived from the structured properties of the number system are more likely to be retained than a hodge-podge of miscellaneous rules and short-cuts.

(2) The number ideas included in this plan are subject to further refinement and development where pupils show the capacity to penetrate beyond the fundamentals. The ratio concept used in *Principle Three*, for example, can be used as a stepping stone to the idea of factors as *makers* of numbers. With this new concept a whole new set of implications is available for exploration.

(3) The system of mental computation provides a means for dealing with estimations and approximations as well as exact computation.

(4) The procedure offers promise of being helpful to a large proportion of the school population. Many of the devices make fewer intellectual demands upon the operator than do the standard written algorisms. Some of the principles described earlier are already in use in a modified written form. A typical procedure for teaching children to handle partial products with two-figure multipliers may be cited as an illustration.

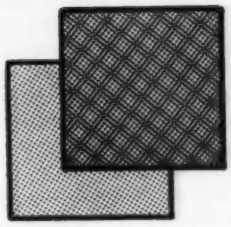
Example: 14 x 32

Modified algorism		Standard algorism	
32	32		32
× 10	× 4		× 14
320	128	128	128
		+ 320	32
		448	448

The encouraging note comes from the report of teachers that such devices are especially helpful to the slower children.

NOW DON'T FORGET to honor teachers every year in your community by formal or informal awards or meetings. The pupils will arrange programs that will be dignified, happy, and long remembered. And don't wait for retirement. It's better for the community to let teachers know they are appreciated all along the way, not at the end of a hard road. And never think that it is only salary that teachers look for, even though they say so themselves sometimes. Nobody has ever invented the kind of money needed to buy what teachers give – love.

SOMEDAY we will be reasonable, and see that the school is open evenings and Sundays for adults and young adults to use the library, the gymnasium, the showers – if these are needed in your community. Volunteer attendants could come from the service organizations. Vandalism in the schools dies out if the schools can't be broken into – because they are open.



THE NEED FOR CORRECTIVE READING IN THE SCHOOL

Catherine Johnson

Remedial Reading Teacher Board of Co-operative Educational Services, Northern Westchester County, N. Y.

What is corrective reading? The literature of the '30s and '40s is replete with references to remedial reading, but there is relatively little use of the term "corrective." For practical purposes, corrective reading will be referred to as a way of handling cases in which pupils have developed an inadequacy in reading in relation to their potential capacity and so need correction of their difficulty. Only when this is done can their achievement correlate with their ability.

Reading programs may be said to be in a transitional stage. This must be true of all educational programs if the research in the field is to be used for the good of all children.

Many of the methods used by remedial teachers can be applied in the regular classroom. The transition previously referred to may be an attempt to give wider scope to some of these methods.

Need for Appraisal of Pupil Ability

The need for appraising pupil ability begins in kindergarten and extends throughout his school life. The first index may be attained through a study of his responses and reactions as compared to his contemporaries. But this criterion alone is insufficient.

There is a need for a statistical measure of his native abilities, both verbal and non-verbal. Standardized tests supply one measure. These need interpretation to teachers who have limited background for understanding them.

Physical conditions are sometimes limiting factors to a child's growth. Despite medical examinations, some children fail because of visual or auditory limitations, vitamin deficiencies, endocrine difficulty, and other physical handicaps. The relation of many of these factors to learning is little understood today.

The child's social and emotional abilities should also be measured. Granting the inadequacies of statistical measures in these areas, such measures are however one means. More practical methods have been to observe and record incidents which indicate such status. These recordings need to be facts, not opinions. One or two facts are insufficient, but a large number of facts which indicate behavior of a consistent pattern are worthy of consideration. A large group of the school personnel can contribute to such indices. The class teacher, nurse, physical education, art, music and other teachers who work with the child should be contributing. The school psychologist or some other qualified should analyze the data and interpret it to all concerned with the child's welfare.

Parent conferences to determine family status and relationships outside of school should be held. Too often, emotional and social maturity is handicapped by out-of-school situations which the school could either help remedy or at least understand.

As the child progresses through school, the findings from the early years should be verified, and any changes should be noted. These serve as the bases for determining what should be expected of the child and how the child should be handled in class.

Need in First Year

The period of readiness and first year reading is a crucial time for every child. Teachers need to use the previous appraisal data at this level. All too often, children entering Grade 1 are automatically "put through" a formal readiness program of the workbook variety without sufficient appraisals having been made.

Index of brightness is not a guarantee that pupils will make progress in reading. There is a large cluster of visual-auditory-memory factors that enter into learning to read at thet first grade level.

The readiness period needs to take these factors into account and provide sufficient practice to develop these skills. Constant checks should be made to verify the child's achievement in these areas. It is doubtful that any one readiness test measures all of these skills adequately. Consequently, informal measures should be used to supplement them.

Bright children need the same skills as the slower ones even though they may need fewer practices to master them. Failure in the visual-auditory-memory areas may inhibit the bright child. Once these are mastered, however, the children need to go on at their own rate of learning with the more formal symbolic reading. If this is stymied in the first years, boredom may result.

On the other hand, the dull and slow-learning children need a very much longer period to develop the readiness skills. Those who make just 85% growth each year may not be ready to read from a first reader before they enter Grade 3. Even then, they will need longer orientation periods to new materials, many first-hand experiences, shorter work periods, more repetitions in varied types of situations and more opportunities for success in the initial stages. It is an unnecessary evil to subject these children to learning situations from which they cannot profit. Many so-called 'remedial' cases come from this group, and these could be prevented if proper appraisal and simple corrective measures were applied as the child advances.

Need to Use the Text as a Tool

The teacher should recognize that the reading texts are merely tools for the wider use of reading. Workbooks fall into this category, too. Nor does any author of a reading text guarantee pupil success if only these two are utilized in teaching the skills required in learning. Teachers' manuals suggest many supplementary activities to be supplied by the teacher.

Continual diagnosis of difficulties must be made and corrective measures supplied as the child progresses. Diagnosis is a more precise index than that accruing from any one test, including the test designed to fit the text used.

The use of wider reading following the establishment of a strong basic sight vocabulary needs to be given more consideration. This wide reading should be based on pupil interest and his concern with learning about such interests. This includes the literature of the times. In the early years, it is limited, but it broadens as the child goes up the scale.

Need for Corrective Measures in the Content Fields

The text of the various content subjects is also a tool. Wider reading is a natural supplement to the teaching of science, social studies, health and all other subjects. That the subject-matter teacher is a teacher of reading has long been recognized, but all too frequently ignored.

Presentation of the technical vocabulary that is used in various subjects is a must. Pupils should not be subjected to verbalism in any area. Just because a child has the ability to analyze and synthesize words and can, therefore, read them orally, is no assurance that he has the experiential backgrounds and understanding to make correct interpretations in a subject. Word meanings should be specific for the use in the area of study and widened in proportion to the abilities of the pupils.

Precise types of study skills are essential parts of the reading program in the various subjects. Though there is some overlapping, the pupils need guidance in the field being studied. Transfer from one field to another or from a reading book to a specific subject is limited. Nor does mastery of such skill follow one presentation. The opportunities for using these skills, followed by a pupil's seeing the need and value of the skill, is a long-range project and subject to many variations – not the least of which is the pupil's ability.

Corrective measures should be applied when a pupil shows a modicum of difficuty. Here again, diagnosis of pupil need is a precise process and highly important.

Need to Utilize the Social Forces

Potent factors that influence educational programs stem from the social scene. Mobility of population and technological advances contribute to the transitional stage.

These forces need to be utilized in today's schools. Children from a different part of the country or the world, for that matter, could be making contributions to the community to which they come. They should be helped to see how they can interpret a different world in their new schools. This would give them the little successes they need in the new and difficult situation. At the same time, their contributions could broaden the backgrounds of the children who are at home. Such use of these youngsters as resource people can only be attained by a teacher who will guide oral discussions and commend the positive and not condemn the negative aspects of the youngster's abilities as, for example, in the case of a pupil who is transferred to a new school through no fault of his own.

Moving pictures, radio, and television are here to stay. The condemnations hurled at them by some teachers are and will continue to fall on deafened ears. They have made an impact on our way of life that is yet to be evaluated. Certainly their teachings can be utilized to 'channel' new interests and awakened zeal in the pupils heretofore untouched by so much assign-read-recite types of learning.

The need for more critical thinking can be aided and abetted by utilizing more critical listening and looking, which are avenues of communication more commonly used by the average citizen than those of reading and writing. The simple experiments that could take place in all classrooms may be stimulated by current science radio and T V programs. These would add the *doing* element to the learning array.

Need for Trained Personnel

Since reading is such a complex process, there is a dire need for trained teachers in the field. Such people should have intensive training in the psychology of reading and in child growth and development as well as many other areas.

They should be able to give guidance in appraisal of pupil abilities, carrying out and interpreting such appraisal when necessary.

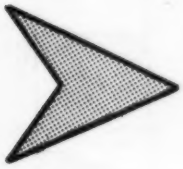
They should be qualified diagnosticians and able to suggest corrective measures and provide remedial measures if a pupil's difficulty has become so grave as to justify these procedures.

They should know many ways to implement the reading program in the beginning stages and to make the essential adjustments as the child progresses in the school program. They should be able to aid in establishing an integrated program from kindergarten through grade 12.

The mobile population and the dearth of teachers makes the need for trained reading specialists even more pronounced.

Reading people need to work with all teachers, especially beginning teachers, in order to demonstrate the emphasis needed on major reading skills.

Once each individual and agency working with the child recognizes the place of reading as a major tool in his total life, there will be more concern on the part of the community, the school and every agency working with children. Only then will it be possible to supply the very best reading program and the most adequately trained reading personnel. When this is done, the emphasis can truly be as it should be – on the prevention of reading difficulties rather than the correction of them.



RATING THE SUPERVISOR??

James F. Baker

Director, Harvard-Boston University Extension Courses

Many attempts have been made during recent years to evaluate or rate teachers. Varying degrees of success have been achieved with the techniques used. Major criticisms of the techniques have been upon the emphasis placed on comparison of teachers and the supposedly subjective opinion of those participating in the rating.

A group of supervisors and administrators became concerned about these problems during discussion meetings in connection with the Elementary-School Principals' Conference held at Boston University in June of 1953. In the group's discussions a philosophy was adopted including the following points of view: (1) the major purpose in evaluating or rating is to point the way for improvement, (2) any evaluation device developed should indicate both strengths and weaknesses in performance of functions, and (3) a willingness on the part of the supervisors themselves to be evaluated might set the stage for better introduction of teacher evaluation.

In light of these points of view, the following evaluation scale was developed by the group to be used by teachers in evaluating the supervisor's activities. The directions for using the scale attempt to point out the procedures for identifying relative strengths and weaknesses without classifying the supervisor as either *good* or *poor* by some subjective criteria. It was the opinion of the group that every supervisor, whether good or poor, has relative strengths and weaknesses which if identified could lead to improvement. Neither in teaching nor in any other profession has perfection in any characteristic been reached.

Perhaps experimentation with such a scale as this will help supervisors move a little closer to their goal of providing maximum help for teachers, and, may at the same time, make teachers more aware of their responsibilities for self-evaluation.

SUPERVISOR EVALUATION SCALE

Directions

Listed below are three sets of statements or characteristics describing the duties of the elementary supervisor or principal. The three sets of statements include aspects related to instructional materials, duties, and personal characteristics which are of concern both to the supervisor and staff.

Beside each set of statements is a five-point rating chart, each column of which must be filled in with at least one check mark for each of statements. Column 1 represents the highest ranking, column 2 the next highest ranking, and so on to column 5 which represents the lowest relative ranking of any of the characteristics.

In completing the evaluation, first read all the items in a single set of statements. Then select the single item of the group which describes the best or highest ranking characteristic with reference to the supervisor being evaluated and place a check mark opposite this item in column 1 of the rating chart. Then select the poorest or lowest ranking characteristic of the set with reference to the supervisor and place a check mark opposite this item in column 5. Continue placing check marks next in column 2, then column 4, and then column 3 so that one check mark appears in each of the five columns. Allocate the remaining items, if there are any in the set, to the columns most representative of the ranking of the characteristic in relation to the other statements. Remember, at least one check mark must appear in each column before allocating any of the other items in the set.

MATERIALS

1. Assisting teachers in selecting and using basic instructional materials .....
2. Assisting teachers in obtaining and using various audio-visual aids .....
3. Assisting teachers in obtaining and using new and supplementary instructional materials .....
4. Making professional educational materials available to teachers .....
5. Giving suggestions and assistance to teachers concerning use of community resources .....

1	2	3	4	5

DUTIES

6. Assisting in orienting new teachers to the school system....
7. Value of supervisor conferences conducted with individual teachers .....
8. Value of small group supervisory conferences (grade groups, subject area groups, etc.) .....
9. Bringing new ideas to teachers from workshops, conferences, and the like .....
10. Preparing teachers for testing programs, schedule changes, and other system-wide activities .....
11. Assisting teachers in testing and evaluating pupil progress
12. Aiding teachers in analysis of pupils' written, creative, and project work .....
13. Assisting teachers thru effective demonstration of methods and techniques .....

1	2	3	4	5

PERSONAL CHARACTERISTICS

14. Constructive and encouraging attitude in making suggestions to teachers .....
15. Interest in and assistance given in implementing teachers' ideas and suggestions .....
16. Work with parents and teachers in the cooperative solution of educational problems .....
17. Evidence of confidence in and respect for effective teaching .....
18. Evidence throughout all activities of appropriate professional appearance and poise .....
19. Sincere personal relations with all school personnel.....

1	2	3	4	5

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NEW BOOKS

PHYSICAL EDUCATION AND RECREATION FOR CLASSROOM TEACHER — ADMINISTRATOR — SPECIALIST

Problems in education are constantly confronting teachers and administrators. There seems to be no limit or end to their development. It is refreshing then, to see that professional groups are developing books that will aid future teachers to identify and solve problems before they become major deterrents to their program.

Such a book "Problems in Health, Physical Education and Recreation"[1] is typically one of these that represents a unique professional contribution to the literature in these specialized fields. It is concerned with showing a logical approach to the identification and solution of problems in these professions. It follows a logical step by step approach by (1) establishing a framework of functions; (2) setting forth the operational principles or goals toward which we are working; (3) identifying the current practices; (4) comparing the current practices to the operational principles and isolating the problems; and (5) proposing solutions to the problems. It is in this latter area that this book has special value for the teacher in this area and also for the school administrator.

This publication also makes an invaluable contribution to the methods that should be utilized in the scientific process. Procedures for preparing reports, resources for problem solving, research techniques, and analysis procedures are dealt with in detail.

A second book, prepared for the specialist and the student of history is: "The World History of Physical Education."[2] It is one of the most scholarly publications to appear in recent years in the field of physical education. Too often, the history of physical education has been dealt with in a sketchy manner. The authors of this book, however, have delved extensively into the literature of the past and have come out with a publication, which not only points up the events that have changed the attitude toward this field of endeavor, but also implications are drawn as to how historical events have affected the profession's growth. It takes the reader from primitive times to oriental civilizations, Greek and Roman cultures, and the cultures of the Middle Ages, through early modern times to the present.

This publication is probably the most comprehensive history ever written in the area of physical education. It is concerned with the general education and cultural backgrounds of various peoples in world history as they relate to the specialized field under consideration. Its potentialities as a resource for professional and lay individuals interested in the changing conceptions of this specialized field is great. (Charles A. Bucher, New York University.)

The teacher in the elementary school will find "Games for the Elementary School Grades"[3] to be a rich source of activities for use in the classroom, gymnasium and playground.

Each activity is carefully described on individual cards and kept in a neat, easy to handle folder. This enables the teacher to quickly select activities for the appropriate grade and to review them with a minimum amount of effort. The games are those that have been proved by constant use with children, to be interesting and successful. Activities of the following types: team, relay, tag, quiet, ball, running and jumping, are to be found in this collection.

Several cards giving good teaching methods and techniques are offered to help the teacher present this type of activity to her pupils. A simple index system describes the type of game, the place recommended as well as the grade for which it was intended.

The classroom teacher will enjoy and appreciate the practicability of the cards.

A very interesting spiral bound book entitled "Art Aids for Elementary Teaching"[4] has just come off the press. It is the type of book that will help teachers acquire a feeling of security in their efforts to instruct in the field of school art education. It will also serve as a guide for recreation leaders and parents who want to help their children learn to express themselves through this medium.

The material presented in the book is intended for the teachers' information and guidance and not to be taught in its entirety to the child.

Objectives of art education are expressed through the philosophy that no child can create or grow mentally without stimulation and challenging experiences. Guidance must be available as the child progresses, shows growth, falters, loses assurance, regresses, shows no advancement.

The development of self evaluation is encouraged by helping the child to answer the following questions:

"Is it the child's own?
Is it child like and meaningful to him?
Does it fill the space well?
Are the colors of high intensity, directly and forcibly applied?
Is there contrast of form, color, time and tone?
Does it show tool control and understanding?
Was the material suitable to the problem used?
Is it neat?"

1. Larson, Leonard A., Fields, Morey R. and Gabrielson, Milton A. *Problems in Health, Physical and Recreation Education.* New York: Prentice-Hall, Inc., 1953.
2. Van Dalen, Deobold B., Mitchell, Elmer D. and Bennett, Bruce L. *A World History of Physical Education.* New York: Prentice-Hall, Inc., 1953.
3. Richardson, Hazel A., *Games for the Elementary School Grades.* Minneapolis: Burgess Publishing Company, 1953. 156 cards $2.00.
4. Paine, Irma Littler, *Art Aids for Elementary Teaching.* Minneapolis: Burgess Publishing Co., 1953. $2.25.

The principles and elements of design are carefully and simply sketched to fill in the background of the teacher, leader or parent's experience.

Story telling pictures and their basic fundamentals are also very clearly illustrated and clarified by a minimum amount of written commentary.

Excellent descriptions are given for the use of crayons, chalk, poster paints, stencils and block printing of many different types, water color, oil paint, cut paper, fountain brush pen, finger painting, spatter painting, plastic materials such as clay, plasticine wax, plaster of paris, carving in soap, papier-mâché and others.

Considerable emphasis is also given to construction and handwork in bookmaking, book covers, weaving, toy construction, pattern making and other such interesting projects. Along with this is a practical guide to posters and their lettering.

BOOKS RECEIVED

General

Howes, Raymond F., Toward Unity in Education Policy, Series I, No. 55, Washington, American Council on Education.

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McGuire, Edna, Backgrounds of American Freedom, New York, The Macmillan Company. 1953.

Means, James Howard, M.D., Doctors, People, and Government, $3.50. Boston, Little, Brown and Company. 1953.

Komarovsky, Mirra, Women in the Modern World, Their Education and Their Dilemmas, $4.00. Boston, Little, Brown and Company. 1953.

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THE EDUCATION GAZETTE. New South Wales, Minister of Education, Sydney.

NEW JERSEY EDUCATION REVIEW. New Jersey Education Association, Trenton, New Jersey. $2.00 per year.

WISCONSIN JOURNAL OF EDUCATION. Wisconsin Education Association, Madison, Wisconsin. $2.00 per year.

VIRGINIA JOURNAL OF EDUCATION. Virginia Education Association, Inc. Richmond 19, Virginia. $1.50 per year.

THE KANSAS TEACHER. Topeka, Kansas. $3.00 per year.

NEW YORK STATE EDUCATION. New York State Teachers Association, Utica, New York. $2.00 per year.

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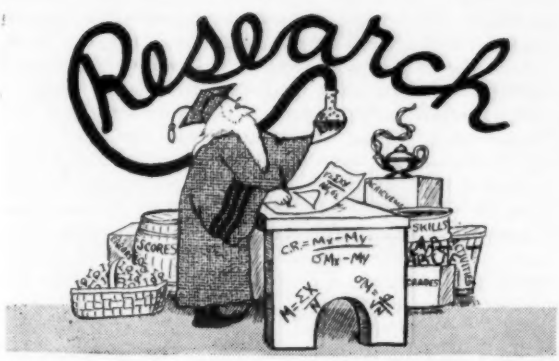

AMERICAN PSYCHOLOGICAL ASSOCIATION

In 1892, a small group of prominent psychologists (a little known creature in those days) met at Clark University in Worcester, Mass., and founded the American Psychological Association. It grew slowly, by 1926 numbered only 500. But in the last two decades the growth has been phenomenal. Today membership in the organization approaches 10,000 psychologists. In September of each year the American psychologists gather in one of the major cities of America for a meeting of the clan. At a time when the nation is looking forward to the World Series and the coming football season, the psychologists are busy comparing and reviewing the year's research, which is as diverse as their interest are manifold, treating personality, perception, morale, leadership, role playing, test construction, market research, learning theory, mental health, old age, to mention a few of the many topics discussed.

In reviewing this research one finds only a small proportion devoted to problems or questions concerning children of school age. To be sure, many experiments are indirectly useful, but one finds much more applied research devoted to military problems or concerned with higher education than with educational problems between grades one and twelve. Perhaps we are so vexed with the mundane questions of sufficient school rooms and teach-pupil ratios that it is irrelevant to suggest that teachers and psychologists are natural allies with a common concern—learning.

Methods of Teaching

We teachers concern ourselves with method and procedure—too much so some claim; however, knowing how to teach is as essential as having something to teach. Our method is usually based on empirical experience, logic, or both, with all their limitations. Frequently, the logical is not psychological. What should be sensible (being logically concluded) doesn't make psychological sense, and learning is a psychological process. Two of the articles in the October issue of The Journal of Education draw sharp attention to this problem in teaching method. LaVerne Strong (6) makes the point, arguing that the typical sequential presentation of material used in compartmentalized programs of instruction is logical but not psychological. Much of Weaver's (7) article centers around questions of the psychological development of number of concepts. Logical analyses of children's understanding of the number system may or may not be psychologically valid. Indirectly, both emphasize the need of a closer union of teachers and psychologists in working on their many common problems.

The limitations of logic unsupported by experimental verification is evident in the research of Dawson (1) at Stanford University on the learning of number concepts. For some 15 years the teaching of the concept of numbers as a group has proceeded on the premise that children move through three stages, the object stage, the pictorial stage, and the semi-concrete stage (geometric representations) in reaching the abstract — number stage — understanding a numerical symbol to be representative of a group. Dawson (1) questioned these premises and tested them experimentally with children in grades 1, 2, and 5. His data suggest that learning does not proceed through these levels of abstraction, that even first grade children are able to perceive groups in simple geometric forms more easily than in pictorial forms, i.e., representing four by a square-shaped figure vs. a picture of four apples. Apparently it is complexity of the number-group presentation, not the degree of abstractness, that impedes learning of number-group presentations. Increasing complexity (lack of symmetry, mixed elements, indistinct contrasts) makes the learning of number concepts more difficult, with the result that children resort more to counting. Simplicity promotes grouping responses. Dawson (1) concluded that the use of complex pictures involving much detail and activity by authors and teachers in work materials presumably because it is "lifelike" increases complexity and slows the acquiring of the mathematical idea of groupness implied in numbers.

Effect of School Atmosphere

Among the many research studies reported by the psychologists in their September meeting were several of interest to teachers. Ricciuti (5) reports an interesting study on the effect of contrasting school atmospheres on behavior of boys. Matching groups to control differences in home atmosphere, 96 fourth- and fifth-grade boys were chosen from two dissimilar school systems—one characterized by permissiveness and flexibility, the second by a rigid, conformist atmosphere. The experimenter was interested in how the two groups of boys differed in their behavior when presented puzzle tasks they were unable to complete, presumed to be frustrating. Observable differences in behavior were evidenced. The children from the permissive environment made more overt and active responses, motor or verbal expressions, including a higher proportion of aggressive responses. The boys from a conformist school atmosphere produced more regressive and passive responses which would not conflict with authority.

It would be interesting to observe reactions of a teacher group to such an experiment for I would hazard a guess that distinct differences in teacher attitudes exist as to which of the observed responses in the boys is preferable. Docility and compliant submission to authority are deemed to be preferred behavior by many in our profession, yet we speak simultaneously of wanting to develop independent self-reliant students. The outcome of the experiment raises several questions. Were the boys in the conformist group more docile because they were less frustrated or because they had learned to avoid direct expression? How do such groups give expression to their aggression, if not in verbal or motor acts

within the setting itself? What association is there with destructiveness, conflict, or aggression outside the frustrating situation?

Some clues to the answers to these questions are reported by Moustakas (4) in a study comparing the frequency and intensity of negative attitudes expressed in play therapy by well-adjusted and disturbed young children. Although the number of children involved is small, making the results suggestive rather than conclusive, the study is of interest. Each child had four play therapy interviews which were tape-recorded and supplemented by observations of movements and actions during the periods. The types of negative attitudes expressed by both well-adjusted and disturbed children were similar, which is saying that both groups do not differ apparently in kinds of attitudes expressed, but the disturbed children do express a greater frequency of negative attitudes and with greater intensity. Moreover, their expressed attitudes are more diffuse in contrast to the well-adjusted children who are more specific and focused in their negative attitudes. In associating this study with Ricciuti's (5) no inference is made that the children coming from the more rigid school environment were more maladjusted, rather that the expression of aggressive attitudes in such environments may be more diffused, and psychologically less desirable. In the Moustakas (4) study the disturbed group expressed more hostility toward home and family, and more anxiety about cleanliness and order. They were more intense in their feeling of hostility directed towards people in general and parents in particular.

Mental Hygiene

There are two additional studies in which children of school and pre-school age have been subjects which pertain to this topic of mental hygiene of child groups illustrating the fruitfulness of the joint efforts of psychologists and teachers in exploring the effects that given methods of handling children have upon their behavior. Granting that the experimental procedures may not be very elegant, nevertheless the results produced are useful. Levin (3) inquired into the child-rearing practices of the mothers of nearly 400 kindergarten children of both sexes, particularly as to severity of punishment for aggression. The aggressive behavior of the children in two situations, classroom and permissive doll-play, was correlated with severity of punishment at home. The results confirmed the premise that the expression of both overt and fantasied aggression is associated with severity of punishment inasmuch as both boys and girls in the highly-punished group exhibited significantly more aggression than the less-punished children, and the amount of aggression displayed increased from session to session. Boys exhibited significantly more overt aggression than girls.

These studies suggest that the long-range effects of procedures used in controlling and directing child behavior in the classroom (as well as the home) need careful scrutiny, for although immediate ends may be served by a given procedure the long-range effects can be undesirable.

The second study mentioned was completed by d'Heurle and Haggard (2) at the University of Chicago Laboratory School. They investigated the relationship between socialization pressures found in the home on 76 third-grade children and compared these to personality patterns and school achievement. Projective tests, achievement tests, and interviews with the children were utilized, as were cumulative records, questionnaires, and interviews with parents. The all-around high achievers, the teacher's pride and joy, faced high parental pressure for school achievement. Besides having developed a preference for academic-type subjects and efficient work-habits, they were more hostile and competitive toward siblings and classmates, and expressed latent negative feelings toward parent figures. They were compliant with teacher demands and wishes, concerned about order and cleanliness. They were facile with words and symbolic processes, inclined to intellectualize experiences. The reverse of this pattern was found for the academic non-achievers. Certain distinctions in personality characteristics were noted in children who excelled in specific subjects, for instance, readers having a richer fantasy life but more restricted behaviorally, while spellers being more passive and conformist, and less spontaneous. Thus differences in academic achievement in the classroom and in personality are associated with the particular socialization pressures in the home. The obvious—that there is more to teaching reading than words—is unnecessary, but the wedding of the psychologist and the teacher in exploring the most complex task of teaching children is not.

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5. Ricciuti, Florence, "A Study of Experimentally Induced Frustration in Boys from Contrasting School Atmospheres," *American Psychologist*, 1953, 8, 419.
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Not only is it very likely that a large part of the American public is confused by the controversies that have arisen over practices, procedures, and programs in our schools, but teachers themselves may also be in a quandary on the issues involved. In recent months books have been published highly critical of the schools. Some of them may be so biased in their presentations that they are not very helpful to school people seeking further insight in analyzing and assessing the present situation.

One book, LET'S TALK SENSE ABOUT OUR SCHOOLS, by Paul Woodring (McGraw-Hill Book Company, Inc.), is one that every school person should read no matter what his educational position. Dr. Woodring is a professor of psychology in the Western Washington College of Education. In the preface he takes the position that his new volume is not a book of answers but a book of information for those who wish to draw their own conclusions. He writes, "Maintaining this position has not proved easy. One who has struggled for twenty years and more with problems of education quite naturally has reached some conclusions, formed some opinions, acquired some prejudices; inevitably these influence the selection of materials and the treatment of ideas.

"In a controversy the one who chooses an intermediate position is beset by difficulties not encountered by the extremist. The extremist has his back (or is it his face?) to the wall and so can be attacked from only one side. The moderate stands in the center of the arena and is vulnerable from all angles. In the field of education there are many who try to find the golden mean, but few of these write books because once the book appears in print the moderate is likely to find himself driven up against one or another of the walls, and thus he ceases to be moderate. Another difficulty is that a moderate book does not sell well and therefore often is not welcomed by the publisher.

"There is a danger, too, that the moderate will seem to avoid taking a firm position on the fundamental issues and that he will give the appearance of being uncertain. It is dramatic to describe an object as pitch black or snow white; no one is excited by the suggestion that it is really a middling gray, and one who so describes it will be accused of being unable to make up his mind. But it so happens that some things *are* middling gray. One of these things is public education in the United States as of 1953. Our thinking about education is in a state of confusion but the schools themselves are neither so bad as some critics have said nor so good as our publicity agents make them appear."

LET'S TALK SENSE ABOUT OUR SCHOOLS is not only a book of sensible information but also is interestingly written. The chapter titles indicate the nature of the discussion. Some of the titles are: "Yesterday and Today," "What is Progressive Education?" "The American Teacher," "Facts versus Methods," "Whatever Became of the Three R's?," "What We know About How We Can Teach," and "Parents and Teachers."

We suggest the great desirability of forming small discussion groups of teachers where the issues presented by Woodring may be given thoughtful consideration. This consideration requires application to the local situation. Schools never have been perfect. The schools of 1963 must be better than those of 1953. We do not make progress by calling, or even thinking, all critics reactionary. We must examine present status through a look at the past and ahead to the future. LET'S TALK SENSE ABOUT OUR SCHOOLS is an excellent way to begin.

Watch for a new volume that will be a welcome addition to a professional library for teachers. The publication, CREATING A GOOD ENVIRONMENT FOR LEARNING, is the 1954 Yearbook of the Association for Supervision and Curriculum Development of the NEA. With its extensive use of illustrations, informal style, and terse, helpful marginal comments, it should become immediately useful in school systems, large and small.

Again in 1954 Boston University is sponsoring credit courses for travel-study in Western Europe and North and South America. In addition, this year there will be an around-the-world tour. All of these courses are offered by full-time members of the Boston University faculty as a part of the summer school program.

The basic aim of the travel program is to make it possible for teachers and other interested individuals to broaden

their educational background through a planned and guided tour. It is principally as an educational opportunity that the tours are offered, and each tour participant enrolls for the specified course listed for the tour.

The following are the tours being offered for the summer of 1954:

ASIA

ECONOMIC AND SOCIAL TRENDS IN INDIA. A two-week workshop in Kashmir as the focal point of a seven-week journey through the Middle East and Far East (students who so desire may continue on around the world at an additional expense of $600). 6 semester credits. $1665.

NORTH AND SOUTH AMERICA

ORIGINS OF NEW ENGLAND, 1620-1820. A two-week survey of the historical development of New England; the first week spent in Boston with side-trips to Salem, Plymouth, Lexington, and Concord, and the second week on the road visiting the major historical areas associated with the growth of New England and the nation. 3 semester credits. $165.

CULTURES OF LATIN AMERICA. During a six-week, 8000 mile air tour through eight South American and Caribbean countries, a study will be made of the effect of the Spanish Conquest upon the life and customs of indigenous Indian cultures. 6 semester credits. $775.

EUROPE (The tours listed below are planned to provide seven weeks in Europe.)

A. EUROPE: HISTORY AND THE ARTS: Literature, painting, sculpture, and architecture in their historical settings in Italy, France, Great Britain, and the Low Countries. Special emphasis on great works of art as a personal experience. 6 semester credits. $775.

B. SURVEY OF EUROPEAN MUSIC. Students will consider basic contributions of Western Europe to the development of our musical heritage. Focal points of the tour will be the many music festivals for which the European summer scene is so widely known. 6 semester credits. $775.

C. THE HISTORY OF WESTERN EUROPE. A tour which will emphasize the past history and present development of areas visited: Great Britain, Scandinavia, France, and other Continental nations. Particular emphasis will be placed upon the Scandinavian countries. 6 semester credits. $785.

D. HUMANITIES IN EUROPE. A course designed to acquaint the student with some aspects of the cultures of six European countries. This is accomplished first through lecture and discussion and then through attendance at dramatic and musical performances, art museums, and cathedrals. Half of the time on this tour will be available for individual side trips. 3 semester credits. $725.

For details and further information write to:

Boston University Summer Travel Courses
332 Bay State Road
Boston 15, Massachusetts

RANDALL-ART PROGRAM

(Continued from page 69)

Summary

In summing up what has been discussed in this article a number of simple conclusions can be pointed out.

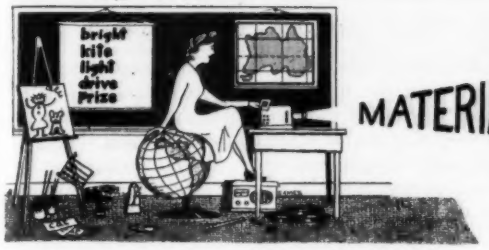
1. There is a definite need for much more training in art for the college student going into teaching.

2. Where the teacher is already on the job and has had limited training in art it will be necessary for the teachers themselves to organize workshops. In this way they may have experience with media which they plan to use as well as discussing current trends in art education. A good bibliography of books and magazines should be made available to everyone.

Teachers at a workshop giving a demonstration on many kinds of printing.

3. Exhibits may be obtained by contacting art organizations, museums, art supply companies, individual artists, stores with art departments and colleges. This may also be a means of getting speakers. Children's art work should always be on exhibit in every school building and classroom.

4. Today art is finding its rightful place in our society more than ever since it has been taken out of the "ivory tower" and became a vital part of each individual as well as the community within which he lives.



FILM AND TEXTBOOK CORRELATIONS FOR ELEMENTARY SCHOOL SCIENCE

For each year of the elementary schools, 30 films which are useful with each of the elementary-science reader series are listed in this free booklet from Young America Films, Inc., 18 East 41st Street, New York 17, N. Y.
(There are 23 other films allied to science, and health. Ask for YAF catalog at the same address. "Films and Filmstrips for Home Economics and Homemaking Classes" lists 15 films and 44 filmstrips in this field.)

New film on "The American Road." The new 1953 Ford Motor Company motion picture catalog is being distributed to the public. The catalog describes 25 movies available without charge to organized groups. They portray American life, vacation areas, educational subjects, and the automobile industry.

A new film added to the Ford libraries is "The American Road," which tells how the automobile changed America since 1903. Ford films are all 16mm sound productions, and 15 are in color. Running times are from seven to 45 minutes.

Free catalog may be obtained from Ford film libraries at 16400 Michigan Ave., Dearborn, Mich.; 15 East 53d Street, New York 22, N. Y., and 1500 South 26th Street, Richmond, Calif.

1954 Annotated Lists. Have hundreds of listings.
Books for SUPPLEMENTARY READING (K-Gr. 9)
PHONOGRAPH RECORDS (K-Gr. 12)
(Send 10c to cover postage.)

There are over 1500 books, classified by grades, kind, and for remedial reading (3d and 4th grade difficulty, 5th and 6th grade interest.)

Fun and fancy, historical, present-day American sports, and space-travel are just a few of the headings.

There are more than 1000 records listed, all of which have been listened to by the editor (Warren Freeman, Boston University). Instrumental music, rhythmics (graded), vocal, language arts, social studies and science, and choral music are all classified.

Investigate the Exhibit Service which can make 20% for your school library from Children's Reading Service, 1078 St. John's Place, Brooklyn 13, N. Y.

Teaching Tools is a new periodical published eight times during the school year, rate $4.00 (sample copy free). This is a manual of classroom-tested techniques. *Teaching Tools*, 1159 N. Highland Avenue, Los Angeles 38, Calif.

An unusual contest that will award travel within continental United States to winning teachers or administrators is announced. For free subscription and news of the contest, write to Peters Publishing Company, 143 Newbury Street, Boston 16, Mass.

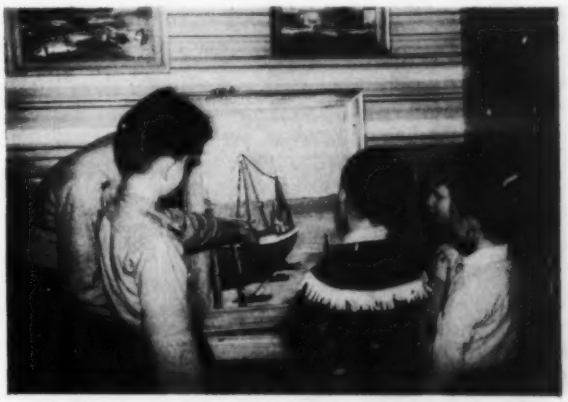
"What's New and Good in Education" published its first issue during the same week which saw the newly-organized Journal of Education first sent to its subscribers. Each month during the school year this attractive four-page two-color digest of current educational articles and teaching tips for all school people will go to more than 12,000 school buildings. With a subscription price of five dollars on the masthead, any school may receive one copy *free of all cost*, through an arrangement with The Alston Studios, picture-takers of American school children.

Hear—"*Lee and Grant at Appomatox,*" and the battle between "The Monitor and the Merrimac" on *Enrichment Records.* Twelve titles are available. Write to Martha Huddleston, Enrichment Records, Inc., 246 Fifth Ave., New York 1, N. Y.

CHILDREN IN MUSEUMS

Is there a local museum of art, or someone with a collection of good amateur or professional paintings?

Children from grades one and two can learn to look for "facts" in paintings, then begin to recognize "atmosphere" which is closely akin to appreciation. Here they are recognizing the characteristics of a summer day as the dragger is repaired on the head.



What's the Weather Going to Be? 16 color photos, including those of all the common clouds, in a booklet 5¼" x 3¼", will help your pupils forecast the weather. This little booklet will be sent (10c) from J. W. Rubin, P. O. Box 8615, Richmond, Virginia. (One of a new series of advertisements on educational aids, sponsored but not supplied by Wrigley's Spearmint Gum. *Parents' Magazine*, Sept. 1953.)

For junior high, free to English teachers, on request from Scott, Foresman and Company (433 E. Erie St., Chicago 11) is an "America Reads" literary calendar for the 1953-54 school year. Each of the calendar's ten pages reproduces in two colors one of the interest-catching pictures from the "America Reads" series of anthologies. A brief caption suggests that students explore the area of reading represented by the selection the picture illustrates. Teachers writing for the calendar are requested to *mention teaching position.*

A PROMISING APPROACH TO PROVISION FOR INDIVIDUAL DIFFERENCE IN ARITHMETIC

John R. Clark, New Hope, Pennsylvania (Formerly Head of Department of Teaching of Mathematics, Teachers College, Columbia University).

If I were teaching arithmetic in the elementary school, I should be eager to "try out" the Springfield, Mass. plan for adapting the instruction to the ability levels of my class.

The Springfield approach assumes:

1. There is a core of subject matter in arithmetic that is needed by all citizens. This means that all pupils in a given grade will be engaged in learning the same content.

2. There are "maturity levels" of learning to work with numbers. The Springfield staff classifies these levels of learning in three categories:

   a) The "understanding" or "concept" level, on which the learner uses a variety of concrete aids;

   b) the "transition" level on which the learner shifts back and forth between level a) and level c);

   c) the "abstract" level, commonly called the "drill" level.

3. In any class, working with a given content, provision should be made for pupils to work on their respective maturity levels.

4. Pupils should continue on the concept level until they are ready (able and interested) to operate on a higher level.

Good teachers are constantly searching for better methods of grouping children. Dr. John R. Clark presents an interesting approach to the problem of providing for individual differences without changing content.

5. Slow pupils may need to work on the understanding level most of the time; bright pupils need much less practice on this level, before they are able to succeed with the abstractions of arithmetical learning.

Under the general sponsorship of Dr. Rolland R. Smith, Coordinator of Mathematics in Springfield, a committee of teachers, organized by grade groups, is engaged in the preparation of teacher helps in implementing this concept of "maturity level" for classroom use. We quote from the mimeographed bulletin the recommendations of three of these committees.

Grade 1. The Meaning of Addition and Subtraction as Contrasted with Memorization of Facts

Committee: Honora Foley, Patricia Keane, Maybelle Kelley.

"In the first grade addition and substraction are developed only on the understanding and transition level. First grade teaching of these concepts should be primarily directed to giving pupils a technique by which they can attack and solve simple problems. Deliberate striving for automatic response to addition and subtraction combinations has no place in the first grade. Children have too much to learn about the meaning of numbers and relationships between them to have time for drill on abstract facts.

Children should know how to find out that 4 oranges and 5 oranges are 9 oranges but to be able to say at once that 4 and 5 are 9 is not a sought after outcome. They should come to understand the meaning of addition and subtraction, they should know when to add and when to subtract, and they should have simple techniques of manipulation, drawing, counting on or off, for getting answers but they are not required to memorize facts. Of course, some of the pupils will learn some of the easier facts because they have had so much experience with them.

Children should discover the addition and subtraction facts for themselves. The teacher does not help and cannot help by presenting statements of facts to be memorized. In such a case pupils are learning words only without any understanding behind the words. At first, objects about the room — pencils, books, pieces of chalk — can be used for manipulation. Soon circles, dots, crosses, or other marks on paper or on the blackboard become easily understood substitutes for the objects.

A transition stage has been reached when, toward the end of the year, examples like $\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$ are given and the children get the answer by drawing 3 circles (000) and then 2 circles (00) and counting to get the answer. Of course in cases where the answer is known without counting, the circles need not be drawn."

Grade 3. Subtraction with Borrowing

Committee: Mary Dailey, Nancy Kenney, Helen Morse, Mary O'Connell, Michaelyn Richardson.

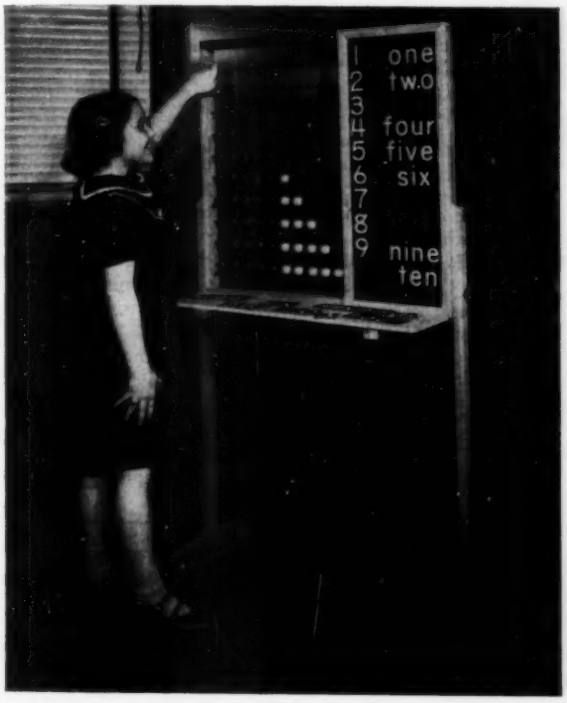
"*Understanding level.* Experience in teaching subtraction with borrowing shows that one of the first things it is necessary for pupils to understand is that they cannot take a larger number from a smaller. The purpose of the first question is to bring out this fact by objective treatment. You are likely to find children who will make the attempt.

Of course, *one* way to teach this topic is to put an example on the board, show the technique, and then drill. Pupils will learn how to do the examples. But the process will be only mechanical without meaning. Psychologists pretty well agree that manipulation without understanding is not of lasting value.

Children should be led to see that they cannot do a subtraction example requiring borrowing as it stands. They can do it, however, by making certain changes. The word "borrow" is so strongly entrenched in the language of teaching subtraction that it is almost impossible to eradicate it. Some authorities, however, avoid it and use "change" instead. For example, "One of these tens can be changed into ten ones."

The following exercises suggest a concrete development. (Use actual money or a reasonable facsimile of the same.)

1. Here are two pennies on the desk. Who can pick up five of them?
2. Here is a dime on the desk. Who can pick up three pennies from it? Can you make a change so that you *can* pick up three pennies?
3. Here are a dime and two pennies. What can be done so that you can take away three pennies? How much is left when you take away the three pennies?
4. Here are four dimes and three pennies. Show how you can take away five pennies. How much is left?
5. Here are four dimes and three pennies. Take away two dimes and four pennies. Note that 3 dimes and 13 pennies has the same value as 4 dimes and 3 pennies.
6. Here are 4 dimes and 3 pennies. Show a simple concrete way of taking away 24 cents.



This kind of work should be carried on until the children can do it without prompting from the teacher.

Transition level. This is the time when the objective treatment and the abstract subtraction are carried on simultaneously.

We wish to subtract 7 from 32. Do it first with the actual money, changing one of the dimes to ten pennies.

$$\begin{array}{r} (32) \\ -7 \\ \hline \end{array}$$

Then set the example up as a subtraction example.

Recall that 32 means 3 tens and 2 ones, or objectively 3 dimes and 2 pennies. When the children are working with money they can see, "7 from 2, I cannot take." Point out the same thing here with the abstract example. What do they do about it with the actual money? They take one of the dimes and change it into ten pennies. They then have 2 dimes and 12 pennies (same value). Indicate that they should do the same thing with the given example. Take one of the tens and change it into 10 ones like this.

$$\begin{array}{r} 2_{1} \\ 3\!\not{2} \\ -7 \\ \hline \end{array}$$

You then have 2 tens and 12 ones and the subtraction is possible.

Continue in the transition stage with many examples, concrete and abstract side by side until pupils are ready for drill on the abstract level.

Abstract level. This is the drill stage when examples are given to be done without the concrete accompaniment. Meaning should not be lost sight of. Every once in a while, a pupil should be asked to explain just what is being done.

All pupils will need to begin at the understanding level. Some will pass much more quickly than others to the higher levels. Classes should be divided into subgroups accordingly. The better and the best pupils should not be kept on the lower levels because some of the slower pupils need to be kept there. Neither should the slower be carried on to the abstract level before they are ready. One group may still be working on the understanding level, another on the transition level, and a third doing abstract drill, all in the same area. Some, having achieved mastery, should be working on an enrichment level.

Some of the pupils will not have gained much skill before the class as a whole should move on to the next topic in the sequence. They should, however, have a concrete understanding and practice with the simplest of examples whenever this is necessary for an understanding of the next topic. While the slower ones are reaching this stage, the better ones are not necessarily (probably not) going on to an advanced topic. There are always small units of work not in the sequence — problem material, and material coming under the head of enrichment for the better pupils — any of which can be omitted by the slower ones without loss to the sequence of topics."

Grade 4: Multiplication Facts of 4.

Committee: Jean Alletson, Elizabeth Beauchemin, Julia Lawless, Jean McMahon, Mildred Rheault, Marjorie Woodin.

"*Understanding level.* The prime consideration here is the understanding of what is meant by 3 fours, 5 fours, or any number of fours. When a first grade child is asked, "How many twos do you see here?" the chances are he has no idea what you mean. The notion of a group of things as one unit is a concept that should be developed gradually in grades 1-3. By the fourth grade it is probably clear, but the teacher should make sure.

0 0
0 0
0 0

A good way to find out is to ask a question like this: "If one apple costs 4 cents, how much must I pay for 3 apples?" Some of the pupils will be able to tell you at once. Others will need a development something like the following. Here are 4 pennies (0000). How many apples can I buy with these 4 pennies. Here are 4 more pennies (0000). How many apples can I buy now? And so on. Note that you have 2 groups of four pennies (2 fours) and then 3 fours. Count to find that 3 fours are 12. It would take 12 cents to buy 3 apples.

0000
0000
0000

Other activities are suggested below.

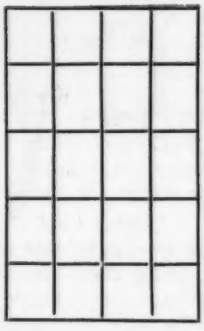
How many stamps are there in each row?

How many stamps are there in two rows?

How much is 2 fours?

Continue until you have discussed five or more rows.

Find the cost of 3, 4, 5, and 6 (or more) oranges at 4 cents each. Draw small circles to find out.



Bring in an egg carton, one that has three rows of 4. Note that 3 fours are 12 and that 4 threes are 12. This reversing of the factors, getting the same product, should be well understood and made use of. When children learn, for example, that 7 twos are 14, they should realize that 2 sevens are also 14.

Find 2 fours, 3 fours, 4 fours, etc., by addition.

4	4	4	4
4	4	4	4
–	4	4	4
8	–	4	4
	12	–	4
		16	–
			20

Use the counting frame to find mulutiples of 4. The answers should be seen without counting. For example, 6 fours comes out as 2 tens and 4 ones or 24.

Count by fours.

Give examples such as these:

2 fours are ? ____ 4 fours are ? ____

3 fours are ? ____ 5 fours are ? ____

Etc.

and let the pupils get the answers in any way they can (drawing circles, adding, counting, etc.).

Transition level. Using the facts you have developed, make a table as shown. Work with problems requiring a knowledge of the table, leaving the table on the board for ready reference. Show the need for learning the table by erasing it and letting the children see the resulting confusion. They cannot carry the table around with them the rest of their lives.

1	4
2	8
3	12
4	16
5	20
6	24
7	28
8	32
9	36
10	40

Division by 4's can be started while the pupils are still working on this level. With the table before them they can learn how to do division. This work will be an added object lesson in the desirability of learning the facts.

Abstract level. Insist that pupils learn their multiplication facts, first in order as in the table; then in random order. It is wise to learn the facts first in order because it is easier and it is useful. If a pupil wants to know how many apples at 4 cents he can get for 25 cents, it is easier for him to search for the answer in an orderly table of a few facts (before he is ready with automatic responses) than it is for him to find it in a random mental survey of 100 facts. He can say to himself: "Can I get 4? Yes. 4 fours are 16. Can I get 5? Yes. 5 fours are 20. Can I get 6? Yes. 6 fours are 25. Can I get 7? No. 7 fours are 28 and I do not have that much money." Drill should not end with the mastery of a table, however. For most of his work in multiplication the pupil will need to know his facts in random order. Use the familiar clock devise and individual help cards for practice in random order.

Pupils must be checked in this topic individually. Test frequently to find out who makes errors and what errors they make. Have the pupils practice diligently on the facts they do not know. Then retest. Pupils should find interest in competing with their own scores. As time goes on test on only those facts that are causing difficulty. Children should learn that in memorizing the facts there is no substitute for hard work.

Gifted child level. Mastery of the multiplication facts is a requirement for all pupils except the mentally deficient. In that sense there is no gifted child level with the multiplication facts. There are no easy ones for the slow pupils and harder ones for the better pupils. But there are other considerations.

It might be supposed that this class of pupil would learn the facts quickly and be proud of the achievement. This is not always the case. Routine drill is often distasteful to them and they will not put forth the necessary energy. They have the ability but will not work. A good thing to do in such cases is to set the stage in such a way that these pupils are definitely handicapped by not knowing the facts. They should not be slow in getting the point.

Others of this group will learn the facts quickly and thereafter they should not be subjected to needless drill. They can be used to help some of the others with their drill. For the most part, however, they should be freed to carry on activities in arithmetic more intensive in scope than attempted by the others."

Obviously the use of this concept of "maturity level" in arithmetic thinking has far reaching implications at any grade level, and with any subject matter. The Springfield group consider it superior to homogenous grouping, or accelerated (or decelerated) progress. Many teachers will be challenged by this new sensible approach to guiding growth in arithmetic learning.

GREEN — GROUPING

(Continued from page 78)

feeling of permanency about the groups but rather one of expectancy regarding this shifting from one group to another. Most of this would arise from the different learning rates of the students which really become apparent as their energies are directed into profitable channels after being held in the vice of whole class instruction sometimes for long periods of time.

Conclusions

Whether grouping should be simple or more complicated will depend upon the needs of the teacher, her personality, her rapport with the class and the materials available. Whatever the type of grouping, however, it is hoped that the decision will be in favor of rather than against grouping in reading. Granted that initial planning is necessary and often time-consuming, still the satisfaction of knowing that such a plan will open up to many students for the first time an opportunity to realize their potentialities should be sufficient. Those who have tried this approach with secondary school students can guarantee to those who would like to try it, a most rewarding and satisfying experience for teacher and students alike as both see results and feel the satisfaction which comes from real accomplishment.

Should any readers of the **JOURNAL OF EDUCATION** wish to share pictures of activities in their schools with others, we hope you will send us glossy prints to consider for publication.

The pictures on this page were loaned to us by the Hingham School Department of Hingham, Massachusetts, and we wish to thank them for their kindness.

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